TELCOM INNOVATIONS GROUP

125 N. Prospect
Itasca, IL 60143
(630) 350-0700 FAX (630) 350-0711

Purchase Agreement
Data/VoIP Systems

Telcom Innovations Group (referred to as "Seller") and **The County of Champaign** (referred to as "Buyer") hereby agree as follows:

1. Seller hereby agrees to sell and Buyer hereby agrees to purchase the following equipment ("Equipment") subject to the following terms and conditions:

A. EQUIPMENT

QUAN.	DESCRIPTION
	1. **TIG Detailed Equipment Itemization BAFO 4.13.23** 2. **The County of Champaign RFP 2023-001 dated January 12, 2023, and Telcom Innovations Group RFP Response submitted on February 14, 2023, shall be made part of this Agreement.** 3. **All equipment/services/etc. will come with a 12-month warranty/guarantee.** 4. **TIG will indemnify and hold harmless the County in the event of liabilities they create through this process.** 5. **TIG will have the minimum required insurance as outlined/documented in the RFP.** 6. **Terms within the RFP are what control/supersede in the event of any conflict between or among the terms of the RFP and the contract/agreement.**

Note: For all digital carrier circuits (T-1, PRI & BRI), TIG will guarantee that all of the required DATA/VOIP hardware and software will be installed, programmed and tested by the providers due date. TIG cannot guarantee any services provided by third parties or their performance in delivering those services. Any failure of third-party providers may result in additional charges from TIG.

Please note that all terms and conditions apply to all new equipment and cabling furnished by Seller directly. Any and all pre-existing cabling, telephone(s), telephone connection equipment, paging equipment, data devices to be reused by Buyer or otherwise not furnished by Seller, is not warrantied hereunder, or covered by TIG's Maintenance Agreement unless otherwise specified.

All cabling required to provide connectivity from Buyer's "Point of Presence," (also referred to as Net POP) provided by AT&T, Inc., is Buyer's responsibility to arrange for unless otherwise specified as part of the TIG itemization attached herein.

CUSTOMER PROVIDED SERVERS-All customer-provided servers will comply with manufacturer server specifications and minimally meet the specifications provided to you by your TIG Account Executive. All hardware, operating system and application software (SQL, Excel, Internet Explorer, etc.) required will be assembled, preloaded and tested prior to being shipped to TIG. Any labor required to bring any customer-provided equipment up to application specifications will be billed on an hourly basis at TIG's Professional Services labor rate.

The Pricing provided includes manufacturer incentives which require the return on certain components. These components must be returned to TIG within 2 weeks for the proposed pricing to be held. In the event the parts are not returned to TIG within 2 weeks, TIG will invoice the amount of the incentive back to the customer.

B. PURCHASE PRICE: **$315,885.05** (excludes sales taxes).

C. TERMS OF PAYMENT

Buyer shall pay to Seller the total Purchase Price indicated in item B above. Terms of payment shall be one-half (50%) payable as deposit upon execution of this Agreement; 40% upon Equipment delivery; 10% payable upon acceptance.

Seller acknowledges receipt of **$ 157,942.54** as deposit against the Purchase Price.

NOTE: Interest at the rate of one and one-half percent (1½%) per month will be charged on amounts not paid by Buyer when due.

IN WITNESS WHEREOF, the parties hereto have caused this, Agreement to be properly executed intending that it should be legally binding upon them and their respective heirs, successors and assigns.

Date: 07/07/2023	Date: 07/10/2023
BUYER: **The County of Champaign**	SELLER: **Telcom Innovations Group**
by: [signature]	by: [signature]
Print: Steve Summers	Print: Randal J. Barchard
Title: County Executive	Title: President

Terms and Conditions Continued—

2. Limited Warranty and Limitation of Remedy.

a. Subject to all of the provisions of this Paragraph, Seller warrants for a period of 90 days (unless otherwise specified on the Equipment Description) from the Date of Installation of the Equipment for use by Buyer, that as of the Date of Installation the Equipment will be free from defects in material and workmanship. This warranty does not, however, extend to any item of Equipment which has been repaired, by anyone other than employees or authorized representatives of Seller, abused or improperly handled, stored, altered or used with third party material or equipment that is defected or of poor quality, or to any item of Equipment that has not been installed by Seller. The warranty stated above shall be in lieu of and excludes all other expressed or implied warranties including, but not limited to warranties of merchantability or fitness for a particular purpose or any warranty arising from course of dealing or usage of trade.

b. If Buyer notifies Seller of any defects covered by this warranty within the above stated 90 day period, Seller shall, at Seller's option, repair or replace the Equipment at its expense. Such repair or replacement shall be Buyer's exclusive remedy for breach of warranty, for negligence, or otherwise in connection with the transaction contemplated by this Agreement.

c. Seller shall not be liable for any special or consequential damages or for loss, damage or expense directly or indirectly arising under this agreement, arising from the use of the equipment sold hereunder, from buyer's in ability to use the equipment either separately or in combination with any other equipment or from any other cause.

d. Seller disclaims any express or implied warranty that its equipment is technically immune from or prevents fraudulent intrusions into and/or unauthorized use of the system (including its interconnection to a long distance network). Customer is hereby warned that fraudulent use of the system, including but not limited to DISA, Auto Attendant, Voice Mail, RMATS, 800, 888 and 900 service, is possible. Customer hereby assumes all risk of such fraudulent or unauthorized use or intrusion.

e. In the event of any manufacturer defects in the covered equipment, Telcom Innovations Group will provide the same remedies to the end user as the manufacturer provides to Telcom Innovations Group.

3. Seller's Installation Obligations.

Seller's services shall be limited to the installation of the Equipment on the Buyer's side of the equipment connecting the Equipment to the telephone system operated by the local telephone utility.

4. Buyer's Installation Obligations.

Seller agrees to deliver and install Equipment at Buyer's business premises ("Premises"). Buyer agrees to make the Premises available and ready for installation of Equipment and at its own expense including the furnishing of commercial power, the necessary environment and the access necessary to install and maintain the Equipment.

5. Seller's Security Interest.

Until such time as Buyer has paid Seller the Purchase Price in full, Buyer hereby grants and Seller hereby retains a purchase money security interest in the Equipment. Buyer agrees to execute all instruments (including financing statements) deemed necessary by Seller under applicable law to establish, maintain and continue perfected Seller's security interest in the Equipment or otherwise protect its rights in and to the Equipment. Seller agrees to furnish Buyer all documents necessary to release such security interest upon payment by Buyer of the Purchase Price in full.

6. Damages Upon Default.

a. Failure of the Buyer to perform any of its obligations under this Agreement, or the insolvency of Buyer, or the breach by Buyer of any warranty or representation hereunder of Buyer shall constitute a default by Buyer.

b. Should default by Buyer occur before delivery of the Equipment to Buyer's Premises, Buyer acknowledges that Seller in connection with the performance of this Agreement will have incurred costs and expenses to Seller's damage. Therefore, Buyer agrees that Seller may retain Buyer's deposit against the Purchase Price as liquidated damages upon default occurring before delivery of the Equipment.

c. Should default occur after delivery of the Equipment:

(i) Seller shall have the right to enter any premises, and may without breach of the peace, take possession of the Equipment and take any other remedy available to it and Buyer shall pay all reasonable costs incurred by Seller in repossessing the Equipment, plus the costs of resale and all costs of collection and interest at the rate of one and one-half percent (1½%) per month on the full balance due of the Purchase Price; and

(ii) Seller shall be entitled to receive damages actually incurred by it as a result of such default including loss of profits.

d. The above remedies shall be cumulative and shall not preclude the exercise of any of Seller's rights available to it under law. Failure to enforce a breach shall not preclude later enforcement.

7. Attorney's Fees.

Buyer agrees to pay, upon demand, any and all costs, fees and expenses, including attorney's fees, incurred by Seller in enforcing any of Seller's rights hereunder.

8. Amendment and Construction.

Any changes in the terms of this Agreement or to any of the Schedules attached hereto and made a part hereof, or any waiver or termination hereunder, shall be effective only if in writing, signed by an authorized representative of Buyer and authorized representative of Seller. The parties hereto agree that this Agreement shall be governed and controlled by the laws of the State of Illinois, to the exclusion of the law of any other forum and without regard to the jurisdiction in which any action or proceeding may be instituted. Any part or parts of this Agreement which is or are declared to be invalid, unenforceable, null and void, or unconstitutional shall not affect the validity of the remaining provisions thereof.

9. Risk of Loss.

Buyer's risk of loss for any damage to or destruction of the Equipment commences upon delivery to Buyer's Premises, regardless of any breach by Seller, and shall be borne by Buyer except for damage due to the willful misconduct of Seller.

10. ENTIRE AGREEMENT.

Buyer has carefully read all provisions of this agreement. This agreement constitutes the complete and exclusive statement of the terms and conditions. There are no representations, warranties or stipulations; written or oral, not herein contained.

Until accepted and signed by an officer of seller at its principal office, this agreement shall not become effective and shall not constitute a binding contract.

11. Force Majeure.

The timeliness of performance by Seller of its obligations under this Agreement is in every case subject to delays caused by acts of God, war, riot, fire, explosion, accident, flood, sabotage, inability to obtain fuel or power, governmental laws, regulations or orders, acts or inaction of Buyer, inability of Seller's subcontractors to perform, or any other cause beyond the reasonable control of Seller, or labor trouble, strike, lockout or injunction (whether or not such labor event is within the reasonable control of Seller). In the event of any such delay, the period of time for performance of services affected by such delay will be extended to reflect the effective delay occasioned thereby.

12. Assignment.

Seller may assign, subcontract, transfer or otherwise dispose of, in whole or in part, any of its interests, rights or obligations under this Agreement. Buyer shall not assign or subcontract any part or all of its interests hereunder except upon written consent of Seller, which consent shall not be unreasonably withheld, and any attempted assignment or subcontracting without Seller's prior written consent shall be null and void.

13. **Sourcewell**

When applicable, Sourcewell & Telcom Innovations Group Contract #022719-MBS

Mitel
Powering connections

Telcom Innovations Group

TIG Detailed Equipment Itemizaton BAFO 4.13.23

Base Proposal has been configured for:

1 **MiVoice Business - Primary (deployment on customer VM)**
Configured for up to 5,000 users - primary call control

1 **MiVoice Business - Resilient (deployment on customer VM)**
Configured for up to 5,000 users - Resilient call control

2 **MiVoice Border Gateways as SIP Session Border Controllers (deployment on customer VM)**
(25) SIP Trunk Channel Proxy Licenses each
(25) MiVoice Business SIP Trunk Licenses each

2 **MiCollab Multi-Application (deployment on customer VM)**
(33) NuPoint Voicemail & Auto Attendant ports
(20) Additional Mailboxes for Auto Attendant Greetings (1 per department)
MiCollab UC Client
MiCollab Softphones
(63) Audio/Web/Video conference ports

(Continued) Base Proposal has been configured for:

1 **MiVoice Border Gateway Teleworker Server (deployment on customer VM)**
For remote Teleworker users (remote physical/softphones)

540 **Unified Communications & Collaboration User Licenses - Standard**
Multi-Device User License (Single # reach/Twinning)
Voicemail & Unified Messaging license
MiCollab desktop/web license w/ Softphone
MiCollab Mobile UC license w/ Softphone
(2) Teleworker Licenses (one for physical, one for softphone)

45 **MiVoice Businesss Enterprise User Licenses**
Full service IP User License for Convenience phones

1 **Mitel Revolution - Life Safety & E911 Enhancements (deployment on customer VMware)**
(50) SLED Bundled Licenses
Each SLED bundle includes: 1 Desktop, 1 Mobile, 1 Endpoint license

585 **Mitel 6920w IP Phones**

3.5" QVGA color display, Wi-Fi dual band 802.11 a/b/g/n, Bluetooth 5.2, mobile integration, full duplex speakerphone, wired and wireless headset support

50 **Mitel 6910 IP Phones**

Basic user phone with 6 programmable keys. HD HI-Q Audio, Full Duplex Speakerphone, PoE Class 2, 10/100/1000, EHS/DHSG

Primary MiVoice Business System (Brookens Administration or TBD)							
Part No.	**Description**	**Qty**	**Unit**	**Total**	**Disc**	**Unit**	**Total**
virtual MiVoice Business Primary							
54005748	MiVoice Business Virtual for Enterprise	1	1,495.00	1,495.00	40.00	897.00	897.00
54005330	Enterprise License Group	1	1,000.00	1,000.00	40.00	600.00	600.00
SIP Trunk x 25 Call Paths with SIP Session Border Controller							
54005339	MiVoice Border Gateway Virtual	1	250.00	250.00	40.00	150.00	150.00
54004491	SIP TRUNKING CHANNEL PROXY	25	50.00	1,250.00	40.00	30.00	750.00
54005400	MiVoice Business SIP Trunks x10	2	900.00	1,800.00	40.00	540.00	1,080.00
54002390	MiVoice Business License - SIP Trunk x1	5	100.00	500.00	40.00	60.00	300.00
Analog Terminal Adapters - 2 port, 4 port and 8 port based on location							
54002701	MiVoice Bus License - Single Line Extension	33	75.00	2,475.00	40.00	45.00	1,485.00
51309161	TA7102 Universal (w/o AC cord)	9	210.00	1,890.00	40.00	126.00	1,134.00
51309162	TA7104 Universal (w/o AC cord)	1	415.00	415.00	40.00	249.00	249.00
51309163	TA7108 Universal (w/o AC cord)	3	630.00	1,890.00	40.00	378.00	1,134.00
50006271	PWR CRD C13 10A 125V - NA Plug	13	17.50	227.50	40.00	10.50	136.50
Mitel Software Assurance							
54009220	SWA Std 1y MiVBus System	1	138.60	138.60	40.00	83.16	83.16
54009221	SWA Std 1y MiVBus DLM	1	0.00	0.00	0.00	0.00	0.00
54009225	SWA Std 1y MiVBus Analog Port	33	5.25	173.25	40.02	3.15	103.95
54009229	SWA Std 1y MiV BG System	1	27.57	27.57	40.01	16.54	16.54
54009230	SWA Std 1y MiV BG SIP Connect	25	6.47	161.75	40.03	3.88	97.00
Total				**13,693.67**			**8,216.15**

Resilient MiVoice Business System (County Courthouse or TBD)							
Part No.	**Description**	**Qty**	**Unit**	**Total**	**Disc**	**Unit**	**Total**
virtual MiVoice Business Resilient							
54005748	MiVoice Business Virtual for Enterprise	1	1,495.00	1,495.00	40.00	897.00	897.00
SIP Trunk x 25 Call Paths with SIP Session Border Controller							
54005339	MiVoice Border Gateway Virtual	1	250.00	250.00	40.00	150.00	150.00
54004491	SIP TRUNKING CHANNEL PROXY	25	50.00	1,250.00	40.00	30.00	750.00
54005400	MiVoice Business SIP Trunks x10	2	900.00	1,800.00	40.00	540.00	1,080.00
54002390	MiVoice Business License - SIP Trunk x1	5	100.00	500.00	40.00	60.00	300.00
Mitel Software Assurance							
54009220	SWA Std 1y MiVBus System	1	138.60	138.60	40.00	83.16	83.16
54009229	SWA Std 1y MiV BG System	1	27.57	27.57	40.01	16.54	16.54
54009230	SWA Std 1y MiV BG SIP Connect	25	6.47	161.75	40.03	3.88	97.00
Total				**5,622.92**			**3,373.70**

MiCollab Multi-Application UC Server, Mitel Border Gateway and User Licenses

Part No.	Description	Qty	Unit	Total	Disc	Unit	Total
virtual MiCollab Multi-App UC Server							
54005442	MiCollab Virtual Appliance	1	995.00	995.00	40.00	597.00	597.00
54005380	MiCClient Licnse - Peering Adv Server	1	0.00	0.00	0.00	0.00	0.00
54005381	MiCClient Licnse - Federation Adv Server	1	0.00	0.00	0.00	0.00	0.00
virtual MiVoice Border Gateway - Teleworker							
54005339	MiVoice Border Gateway Virtual	1	250.00	250.00	40.00	150.00	150.00
Additional Mailboxes - Auto Attendant x20							
54005610	MiCollab NPUM MiVBus Mailbox Licensesx10	2	350.00	700.00	40.00	210.00	420.00
Basic IP User License - Convenience Phones							
54004975	MiVoice Bus License - Enterprise User	45	175.00	7,875.00	40.00	105.00	4,725.00
Unified Communications & Collaboration User Licenses x540							
54006542	UCCv4.0 STND User for MiVoice Bus x1	40	325.00	13,000.00	40.00	195.00	7,800.00
54006543	UCCv4.0 STND User for MiVoice Bus x50	10	13,800.00	138,000.00	40.00	8,280.00	82,800.00
Mitel Software Assurance							
54009224	SWA Adv 1y MiVBus User	45	11.87	534.15	40.00	7.12	320.40
54009186	SWA Std 1y MiCollab System	1	110.25	110.25	40.00	66.15	66.15
54009189	SWA Std 1y MiCollab UM Mailbox	20	3.78	75.60	39.95	2.27	45.40
54009209	SWA Std 1y UCC Std MiVB	540	22.00	11,880.00	40.00	13.20	7,128.00
54009229	SWA Std 1y MiV BG System	1	27.57	27.57	40.01	16.54	16.54
Total				**173,447.57**			**104,068.49**

Mitel Revolution E911 & Life Safety Mass Notification - 50 SLED bundles 1 Year

Part No.	Description	Qty	Unit	Total	Disc	Unit	Total
Mitel Revolution Software - 12 month subscription							
51309959	Revolution SLED BNDL - up to 1000 (1 mo)	600	2.35	1,410.00	40.00	1.41	846.00
51309981	Mitel Revolution Subscrip Term (months)	12	0.00	0.00	0.00	0.00	0.00
51309983	Mitel Revolution for MiVB	1	0.00	0.00	0.00	0.00	0.00
Professional Services							
53004330	Mitel Revolution Service Solution	4,400	1.00	4,400.00	0.00	1.00	4,400.00
Total				**5,810.00**			**5,246.00**

Mitel IP 6900w Phones

Part No.	Description	Qty	Unit	Total	Disc	Unit	Total
Mitel 6900w Series Phones							
50008385	6920w IP Phone	585	405.00	236,925.00	40.00	243.00	142,155.00
50006766	6910 IP Phone	50	209.00	10,450.00	40.00	125.40	6,270.00
50006921	6900/6800 Wall Mount Kit (10 Pack)	1	319.00	319.00	40.00	191.40	191.40
Total				**247,694.00**			**148,616.40**

Cost Summary of Hardware & Software

Total	**$446,268.16**
Line Item Discounts	**-$176,747.42**
Total Hardware & Software	**$269,520.74**
Additional Public Sector Discount	**-$38,635.69**
Total Discounted Hardware & Software	**$230,885.05**

Public Sector Discount is a one time discount based on the above configuration
This quote is based on the Mitel Sourcewell (formerly NJPA) contract #022719-MBS

TIG Implementation

TIG Implementation Assumes a continguous installation of the entire project on an agreed timeline.

Project Management	
Network Analysis	
Installation - Core VoIP Systems	
Installation - Resilient VoIP Systems	
Installation - Database	
Installation - Applications	
Desktop Installation & Placement	
Training Sessions	
Cutover coverage - Follow-up	
1st Year TIG Enhanced Support & Maintenance (Included N/C)	
Total Implementation	**$85,000.00**

Grand Total - Base Proposal Phone System

Total Discounted Hardware & Software	**$230,885.05**
Total Implementation	**$85,000.00**
Base Proposal Phone System Total	**$315,885.05**

TIG Industry Standard Support & Mitel Standard Software Assurance Years 2 through 5

Mitel Software Assurance is subject to future additions of software. The pricing shown below for future years is based upon the current design and licenses quoted above. This pricing is subject to manufacturer price increases, but will continue to have applicable public sector discounts applied.

Year 2		
	TIG Industry Standard Maintenance	**$12,635.40**
	Mitel Standard Software Assurance	**$8,919.84**
		$21,555.24
Year 3		
	TIG Industry Standard Maintenance	**$12,635.40**
	Mitel Standard Software Assurance	**$8,919.84**
		$21,555.24
Year 4		
	TIG Industry Standard Maintenance	**$12,635.40**
	Mitel Standard Software Assurance	**$8,919.84**
		$21,555.24
Year 5		
	TIG Industry Standard Maintenance	**$12,635.40**
	Mitel Standard Software Assurance	**$8,919.84**
		$21,555.24

Option S13: Auto Dialer

Opt-S13 requires further discussion as described in RFP response Tab 4 Scope of Services. Our solution is fully capable of delivering a variety of auto-dialers, but will ultimately be dependent on the level of integration with other system(s); if any. TIG has experience deploying advanced Contact Center Solutions and has previously received Mitel's Contact Center partner of the year award. TIG has specific experience implementing Mitel IVRs and Auto Dialers specific to County Governement needs. This includes but is not limited to Juror notifications with database dips and Health and Human Services outcall appointment reminders.

Option S14: IVR

Opt-S14 will require some further discussion as descirbed in RFP response Tab 4 Scope of Services. TIG has a great deal of working experience deploying simple to very advanced IVRs - this ranges from a few ports for a small group of users to 1000 user Contact Center environments with full customization. Based on the Vendor Q&A, we may be able to accomplish the County's goals at a fraction of the price leveraging our MiCollab NuPoint Auto Attendant. We want to look at the solution wholistically, since many applications are complimentary (e.g. Mitel Call Accounting, Mitel Contact Center, IVR and Auto Dialer are all from the same suite of our Contact Center specific applications and there are economies of scale when deploying certain applications with one another). We are confident that we can find the appropriate IVR/AA solution for the County's current and future needs.

Option S15: Call Accounting - deployment on VM

Cradle to Grave reporting as described in section Opt-S15, Ancillary Questions #6 and Proposed Innovations TAB 6.

Part No.	Description	Qty	Unit	Total	Disc	Unit	Total
MiVoice Analytics - Mitel Call Accounting configured for 650 extensions and 1 administrator							
54006793	WG/CC System Administrator x1	1	850.00	850.00	40.00	510.00	510.00
54006796	MiVoice Call Accounting Starter Pack	1	1,300.00	1,300.00	40.00	780.00	780.00
54006797	MiVoice Call Accounting Extension x50	12	300.00	3,600.00	40.00	180.00	2,160.00
Mitel Software Assurance							
54006933	CC Standard Software Assurance	747	1.00	747.00	40.00	0.60	448.20
TIG Implementation & 1st Year Maintenance							
	TIG Labor	1		1,000.00			1,000.00
				7,497.00			**4,898.20**

Option S16: Call Backs

Opt-S16 will require some further discussion as described in RFP response Tab 4 Scope of Services. Callbacks can be implemented with ease once the ACD/Contact Center environment has been appropriately sized. Without knowing how many ACD agents/groups/paths the County may be looking at, we cannot price this until we do further discovery with this use case.

TIG Option #1: Mitel Premium Software Assurance

Mitel Premium Software Assurance is a highly recommended subscription uplift from the Mitel Standard Software Assurance included. Mitel Premium Software Assurance is mentioned and described in our RFP Response in the following sections; Tab 4: Scope of Services Warranty & Maintenace Support; Tab 4: Scope of Services T2; Tab 4: Scope of Services Opt-S1; and in full detail in Tab 6: Proposed Innovations. Major benefits include technical support upgraded from 8x5 from Mitel to 24x7, Mitel Performance Analytics (Proactive Monitoring) and Mitel University unlimited training.

Part No.	Description	Qty	Unit	Total	Disc	Unit	Total
Mitel Software Assurance uplift (this is based on TIG's base proposal and does not include any Optional applications)							
	Uplift from Mitel Standard SWA to Premium	1	4,810.47	4,810.47	40.00	2,886.28	2,886.28
				4,810.47			**2,886.28**

TIG Option #2: Power Injectors to address non-PoE switching

Further discussion is requested - pricing provided is equipment only and does not include cabling or related labor. Best practices for all IP Phones in our industry is to centrally power with PoE Switches. If the existing investment in the County's Enterprise switching does not have Power over Ethernet, power injectors can be added to insert power into the Ethernet station cable. This offers protection in event of a power outage assuming the network rooms have generators or UPS. The alternative would be to add power bricks at every work station. Data Sheets for the proposed Power Injectors have been provided at the very end of Tab 15. If the County wishes to procure a different brand, install PoE switches, or AC power adapters, we are open to any solution and happy to discuss all available options pros and cons.

Part No.	Description	Qty	Unit	Total	Disc	Unit	Total
24 Port IEEE 802.3af Compliant 10/100/1000 with 15.4W output/port							
	PD6524G/AC/M/F	1				906.29	906.29
4 Port IEEE 802.3af Compliant 10/100/1000 with 15.4W output/port							
	PD-3504G/AC	1				175.08	175.08

TIG Option #3: Mitel 3300 Survivable Branch Office Gateways

Part No.	Description	Qty	Unit	Total	Disc	Unit	Total

Additional Mitel 3300 Local Resilient Gateways - offers additional protection from WAN failure + local PSTN trunking. Each Mitel 3300 CX SBO natively supports up to 150 phones with resilient fail-over, 6 Loop Start (POTS) and 4 ONSp (Analog Station ports)

Note: Labor & material is TBD until a finalized scope of work is generated for this section only.

Note: larger Mitel 3300s could be used instead of Primary and Resilient VM call control as proposed, further discussion is requested.

Part No.	Description	Qty	Unit	Total	Disc	Unit	Total
Mitel 3300 Survivable Branch Office Gateway							
52002547	3300 CX Analog Survivable Branch Office	1	3,050.00	3,050.00	40.00	1,830.00	1,830.00
50006266	3300 CX(i) II Controller SATA SSD	1	150.00	150.00	0.00	150.00	150.00
50006271	PWR CRD C13 10A 125V - NA Plug	1	17.50	17.50	40.00	10.50	10.50
Mitel Premium Software Assurance							
54007815	SWA Prem 1y MiVBus System	1	179.55	179.55	40.00	107.73	107.73
				3,397.05			**2,098.23**

TIG Option #4: Additional Phones & Accessories

Part No.	Description	Qty	Unit	Total	Disc	Unit	Total
6900 Series Phones							
50008301	6905 IP Phone	1	127.00	127.00	40.00	76.20	76.20
50006766	6910 IP Phone	1	209.00	209.00	40.00	125.40	125.40
50008385	6920w IP Phone	1	405.00	405.00	40.00	243.00	243.00
50008386	6930w IP Phone	1	520.00	520.00	40.00	312.00	312.00
50008387	6940w IP Phone	1	685.00	685.00	40.00	411.00	411.00
50008271	6970 IP Conference Phone	1	908.00	908.00	40.00	544.80	544.80
50008272	6970 Ext Microphones (2-pack)	1	325.00	325.00	40.00	195.00	195.00
6900 Series Accessories							
50006763	68xx/69xx Bluetooth Handset	1	190.00	190.00	40.00	114.00	114.00
50006874	M695 PKM	1	220.00	220.00	40.00	132.00	132.00
50006921	6900/6800 Wall Mount Kit (10 Pack)	1	319.00	319.00	40.00	191.40	191.40
51306580	BT Speakerphone	1	413.00	413.00	0.00	413.00	413.00
Mitel Headsets							
51305332	Integrated DECT Headset (NA)	1	358.00	358.00	40.00	214.80	214.80
51310035	H10 Stereo USB Headset	1	160.00	160.00	40.00	96.00	96.00
51310036	H20 Mono Analog Headset w/ QD Cable	1	235.00	235.00	40.00	141.00	141.00
51310037	H30 Stereo CC USB Headset w/ QD Cable	1	250.00	250.00	40.00	150.00	150.00
51310344	H30 Link Controller	1	94.00	94.00	40.00	56.40	56.40
51310038	H40 DECT Stereo Headset (NA)	1	445.00	445.00	40.00	267.00	267.00
Mitel 802.11 WiFi Phone							
51309245	Mitel 5634 WiFi Handset w /battery & clip	1	426.00	426.00	0.00	426.00	426.00
51015423	Mitel 5613/14/24/03/04/34 Charger (not EU)	1	62.00	62.00	0.00	62.00	62.00
51301221	Mitel 5613/14/24/34 Programmer	1	174.00	174.00	0.00	174.00	174.00

Telcom Innovations Group Table of Contents

Telcom Innovations Group

February 14, 2023

The County of Champaign
M.C. Neal, Chief Information Officer
Brookens Administrative Center
1776 E. Washington Street
Urbana, IL 61802

Dear Mr. Neal:

Telcom Innovations Group (TIG) is pleased to respond to the **The County of Champaign's Request for Proposals (RFP 2023-001) for Countywide Phone System/Services and has received RFP 2023-001 Vendor Questions and Answers.** TIG has provided a comprehensive proposal that provides Champaign County with a solution that addresses each requirement outlined, offering a competitive initial investment, low total cost of ownership, and clear scalability options for the future. TIG's solution provides an accessible, intuitive system for both user and administrator, and a system that is highly flexible.

For ease of review, all information and responses have been included in the order requested per the RFP. Following the references section, additional supplementary information has been included. This document outlines our comprehensive solution to deploy a turn-key solution for the County. The actual sequence will be determined by things like available budget money, available County resources, the current system issues/failures/priorities and any departmental timing that might be seasonal. We look forward to working with County to develop a complete and accurate SoW & Project Plan mutually agreed upon.

With this investment into the future of communications, the County will move into a contemporary Unified Communications System that will grow with its needs. Our solution will offer flexibility, redundancy, deliver feature rich call control and management and allow a hybrid approach to the transition of the County's voice services. We feel strongly that TIG can offer you the best long-term solution at a fiscally responsible cost. **Experience is critical, please be sure to review TIG Customer References.** Please feel free to contact us with any questions or concerns regarding our proposal. It is our sincere hope to meet with you in the near future as a finalist and look forward to presenting the Mitel/TIG solution to you.

Respectfully,

Matthew Schwartz
Sr. Solutions Architect
Primary Contact
630-616-4236
mschwartz@ask-tig.com

Joe Splinter
Controller

Executive Summary:
TIG Solution Summary for The County of Champaign

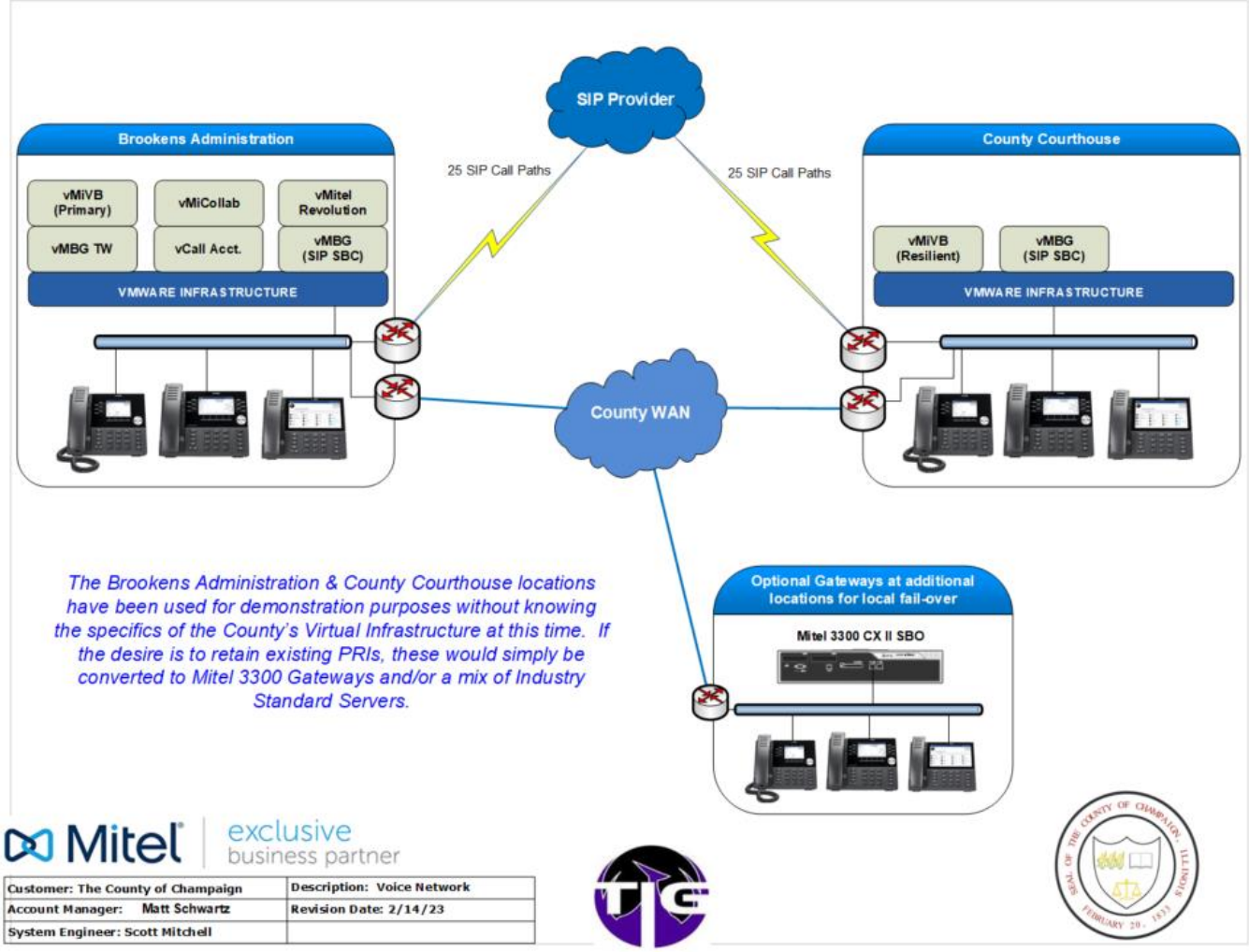
After considerable time and thought, Telcom Innovations Group (TIG) and Mitel are proud to present The County of Champaign with a **Premise Based Solution.**

We believe that we are uniquely positioned to offer great insight into a customized path that will make the most sense for the County, leveraging TIG's many years of experience working with similar customers.

Design Overview: Base RFP Proposal

- **TIG will protect the County's initial investment with our highly flexible Mitel MiVoice Business (MiVB) solution and associated licenses. This will modernize the County's capabilities with Unified Communications features as described in the RFP and flexible options to tailor this solution specific to the County's environment. We understand this is a long-term investment and the platform will allow for plenty of future growth or changes needed.**
- ***At the core of our Base RFP Proposal, we accomplish the following:***
  - End user IP telephone modernization. Introducing the 6900W series phones and the benefits that come with them.
  - Replace the antiquated systems with Mitel's Flagship Platform (MiVoice Business) which will allow the flexibility to deploy as a single gateway, or multiple gateways in a cluster. As proposed, our solution incorporates (2) MiVoice Business gateways – Primary and Resilient (Fail-Over) on County VMware/Hyper-V.
  - Geo-Redundancy & Resiliency for mission critical applications – automatic and seamless protection from outages for SIP trunking, call gateways, and network failures.
  - Provide bundled UCC users licenses that allow end-user flexible Unified Communications. This allows all users the freedom to use physical 6900 series desk phones at home or in the office, PC/MAC/Mobile MiCollab Client with Softphone, and Audio/Web/Video collaboration.

- Unified Messaging is capable of being deployed with Simple forwarding (SMTP forwarding), Standard (Preferred method for Government entities – delivers an internal hyperlink to email and streams audio from Voicemail server, so that FOIA and message retention policy burdens are eased), Advanced (Full integration where e-mail platform handles the messages).



VMware vCenter management tools such as vMotion, storage vMotion, High Availability, SRM, DRS, and standard existing backup procedures allow further redundancies up to and including calls connected in a failure state. When leveraged with native Mitel IP Phone resiliency (Fail-over to alternate gateway), this adds Five 9's redundancies that are otherwise unachievable. If the County does not wish to leverage VMware, we can discuss a full or hybrid deployment with purpose built hardware we call Mitel 3300s, Industry Standard Servers, Hyper-V, or a variety of other platforms including public/private cloud.

Design Overview: TIG's base proposal includes:

- ***MiVoice Business on customer VM – Primary Call Control***
  - Support of up to 5,000 users
  - (635) 6920w
  - MiVoice Border Gateway on County VM (both MBGs are clustered and can handle SIP trunk load balancing and fail-over)
    - SIP Session Border Controller with 25 MiVB SIPT licenses and 25 SIPT Channel Proxy licenses
  - Enterprise License Manager/Designated License Manager
  - LDAP integration is handled through vMiCollab single point provisioning.

- ***MiVoice Business on customer VM – Resilient Call Control***
  - Support of up to 5000 users with 100% call feature preservation
  - Alternate design "Option 2: Mitel 3300 Survivable Branch Office Gateways" could be used in addition to, or in place of MiVoice Business Resilient Call Control.
    - Local Mitel 3300 CX II Survivable Branch office allows for central registration on Primary call control and distributed local fail-over at each remote location.
  - MiVoice Border Gateway on County VM (both MBGs are clustered and can handle SIP trunk load balancing and fail-over)
    - SIP Session Border Controller with 25 MiVB SIPT licenses and 25 SIPT Channel Proxy licenses

- ***MiCollab Multi-App Server on customer VM***
  - 635 UCC Standard for all users
    - Multi-Device User License (Single # reach/Twinning)
    - NuPoint Voicemail & Unified Messaging licenses
    - MiCollab Desktop Mac/PC/Web license with Softphone
    - MiCollab Mobile Apple/Android client with Softphone
    - Point to Point video calls
    - 2 Teleworker Licenses (1 used for physical phone, 1 used for Softphone) for work at home/remote users/mobility.
    - Audio/Web/Video Conferencing
      - 10 ports are given with the 1st UCC Standard license, for each additional 10 UCC Standard license, 1 additional port is given. The total number of ports available for the County is 73 AWV ports.
  - County states ~600 active voicemail boxes, these are accounted for with UCC Standard User licenses.
    - 20 Additional mailboxes have been provided for the 20 departments mentioned in the RFP – specifically, these will address Auto Attendant for each of the departments.
    - The NuPoint Voicemail/Auto Attendant system as configured will provide 38 ports (simultaneous users accessing the Auto Attendant or dial-in voicemail)

- ***Mitel Revolution on customer VM***
  - E911 Kari's Law and Ray Baum's Act compliance
  - Enhanced Life Safety and Mass Notification
  - 50 SLED bundles include: 1 Device, 1 Mobile, 1 Desktop license.
  - Secondary High Availability is an option that can also be discussed.

TIG Scope of Services:

Scope of Services: Warranty

Mitel/TIG shall warranty the entire VoIP Telephone System to be free of defects in materials and workmanship for twelve (12) months from installation. Defects occurring during the warranty period shall be fixed free of charge including all parts, labor, and shipping. Telcom Innovations Group will ensure that all manufacturers recommended software revisions/ updates will be installed free of charge during this warranty period. The Mitel warranty includes standard hardware and software as described below:

Hardware Warranty

Term	**12 months from installation (not acceptance)**
Conditions	**All hardware components will be free from defects in material and workmanship under normal use, and will perform in substantial compliance with the manufacturer's specifications**
	Customer can elect to repair or replace the defective parts under the exclusive remedy and recourse provision of the hardware warranty.
	Mitel may use remanufactured certified parts that meet factory specifications. Such replacement parts will be covered for the remainder of the existing hardware warranty period. Any parts removed shall become the property of Mitel.
	The hardware warranty is Return to Depot; a full support plan must be purchased to upgrade to 24-7 or 8x5 on-site support.
	Labor is provided based on time and materials.

Software Assurance/Warranty

Term	**12 months from installation (not acceptance)**
Conditions	**Software media will be free from defects in material and workmanship under normal use. The software (including any installed release) will perform in compliance with the manufacturer's specifications.**
	Deficiencies deemed the manufacturer's responsibility will be corrected by Mitel within a reasonable time frame or the software replaced.
	Labor is provided based on time and materials.

TIG will make a maintenance contract available on the system until end of support with Mitel. TIG still supports customers that are no longer manufacturer supported with our in-house expertise.

During the warranty period, or as long as the *County* is under TIG maintenance and has current Mitel Software Assurance, software upgrades for problem/bug-fixes are available to the *County* at no charge.

- **TIG Maintenance Support** ***(Included Year 1 with pricing for Years 2 through 5)***
  - All Parts
  - All Labor
  - 24 X 7 X 365 remote and on-site support for a major outage
  - Installation of required patches for proper operation of telephone and voice Mail systems.
  - 30 minutes of Free remote programming per day
  - Ongoing consultation to assure both system and users optimum working conditions
  - TIG Maintenance provides extended coverage on all TIG provided hardware & software.
  - As an Option, multiple years may be prepaid for TIG Maintenance at a discounted rate.

- **Mitel Software Assurance** ***(Included Year 1 with pricing for Years 2 through 5)***
  - ***Mitel Standard Software Assurance has been proposed.***
    - Entitlement to new major Software Releases, including new functionality as provided
    - Entitlement to hot fixes and service packs
    - Technical Support Services 8x5
      - Case management, technical inquiry
      - Service Level Objective for issue resolution on supported software releases
      - Access for Mitel Partner Certified Technicians
      - Telephony and web ticket service, knowledge base access
  - ***Mitel Premium Software Assurance has been proposed as an Option***
    - Technical Support Services 24x7
    - Mitel Performance Analytics (MPA)

- Fault reporting
- Performance monitoring, voice quality and traffic
- Server Metrics
- Hardware, Software and License Inventory management
- Report generation – on demand or automated

- End customer on-line training
  - Access to Mitel University Administration and User courseware

Scope of Services: Documentation

- **All relevant documentation will be provided as part of TIG's deliverables.**
  - **Data sheets**
  - **User quick start guides**
  - **End user customized training guides and cheat sheets**
  - **Technical & Admin documentation**

Scope of Services: Required and Desired Features

REQUIRED FEATURES	
SERVICE	
S1	Voice redundancy **Fully compliant. The solution as designed supports native IP Phone resiliency (Fail-over from primary to resilient call controller). Our solution also includes (2) SIP Session Border Controllers that can load balance incoming/outgoing SIP trunk traffic. As designed, we are configured for (25) SIP Call Paths at Primary location and (25) SIP Call Paths at Resilient location. If the desire is to remain with traditional PRIs, we can accommodate with the addition (or replacement of proposed vMiVB on County VM) with purpose-built gateways and PRI cards. We have found that most carriers will allow a conversion from PRI to SIP at the same or lower costs, SIP offers some greater flexibility with redundancy options.** **95% + of our net new customer on-premise deployments involve customer VMware/Hyper-V in whole or part of the solution. Specifically, greater redundancies can be achieved with modern hypervisors allowing for Five 9s without introducing a lot of additional hardware. For example, VMware vCenter tools such as vMotion and High Availability are available features with our voice applications. Since, at this time we do not fully understand the County's environment, we would welcome further discussion to develop the best possible solution for the County – ultimately, this may be hybrid environment that leverages the best of VM and purpose-built or industry standard hardware. As County IT strategies may shift over time (e.g. a new data center is introduced) the investment is protected. Many customers of TIG have been successfully migrated to a virtual environment over time with original installs on purpose**

	built hardware.
S2	Support - Business days/hours (Monday - Friday, 8a - 5p CST), with 2-hour response time **Fully compliant. The TIG maintenance provided is Monday through Friday 8-5 CST and includes 24x7x365 support for major outages. We acknowledge and agree to a 2 hour response time guarantee.**
S3	Unique four-digit internal phone extensions **Fully compliant. The solution is most commonly deployed with four-digit internal phone extensions. Depending on the existing 350 DIDs, these are sometimes matched with the DIDs for ease of use. If the County is using four-digit internal phone extensions currently, these can be retained as long as there are no number conflicts between disparate systems today (i.e. Brookens Admin and Courthouse share an extension)**
S4	Enhanced 911 service **Fully compliant – base proposal meets & exceeds requirements. Note: The actual ELIN (Emergency Line Identification)/PSAP (Public Safety Answering Point) information is typically procured on a monthly basis from the SIP/PRI carrier or 3rd party such as RedSky. We will work with the County to ensure a complete Life Safety and E911 solution is deployed.** **Our core solution (MiVoice Business) is compliant with the latest requirements, in addition we have also proposed Mitel Revolution as part of our base proposal. We feel this is an important application to further enhance the life safety requirements in a modern UC system. Information on Mitel Revolution (included in our base proposal) can be found in TAB 6 – Proposed Innovations and pricing in our Detailed Equipment Itemization TAB 10.** TIG will continue to work with The County of Champaign to ensure any changes to the system during this process are accounted for. The base proposal solution is capable of sending MAC updates to the Public Safety Answering Point (PSAP) according to National Emergency Number Association (NENA) standards. This ensures that The County of Champaign inventory is synchronized to the PSAP ALI (Automatic Location Identification) database. The Mitel solution also performs automatic Customer Emergency Services ID (CESID) updating for IP devices moved to a known location. The MAC address of the Layer 2 switch to which the device is connected maps and updates the stored CESID address against that of the device. The PSAP has a map of physical locations versus their CESID. Mitel will set up The County of Champaign database to have a map of CESIDs to the Layer 2 switch port MAC address. The system maps the given Layer 2 switch port MAC address to the user directory number. The station location is tied to the Layer 2 switch MAC address of the port. This may be the local switch room or work floor, depending on deployment specifics. The IP address of a telephone is contained within the MiVoice Business database and associated with the MAC address in the data network switch to which it is

connected. If the telephone's location is changed, the database will update automatically, provided the MAC address exists in the database.

MiVoice Business CESID support complies with emergency services regulations (such as the FCC's Enhanced 911 standards) requiring PBXs to support CESIDs.

For a 911 call to be compliant with FCC guidelines, the call must report a CESID to the Public Safety Answering Point (PSAP). At a minimum, you must define a CESID for each directory number (DN) in the CESID Assignment form. To ensure that CESIDs are updated correctly, promptly investigate and address all CESID-related alarms whenever a device is moved. You may have to return a phone to its original location if the move was not authorized or update the CESID Assignment and/or L2 to CESID Mapping forms. Alternatively, you can populate the L2 to CESID Mapping form in advance of a device move.

Our proposed solution is compliant with Kari's Law, which went into effect on February 16, 2020, places obligations on multiline telephone systems (MLTS) manufacturers, importers, lessors, installers, managers and operators. Kari's Law is implemented by the rules set out in FCC 19-76, which was released in August 2019.

Persons who manufacture, import, sell, and/or lease a MLTS must ensure that the MLTS software/hardware includes a setting that, when turned on, enables users to directly dial 911 (i.e., without dialing any additional digit, code, prefix or post-fix) from any station equipped with dialing facilities as soon as the system is able to initiate calls to the Public Switched Telephone Network (PSTN).

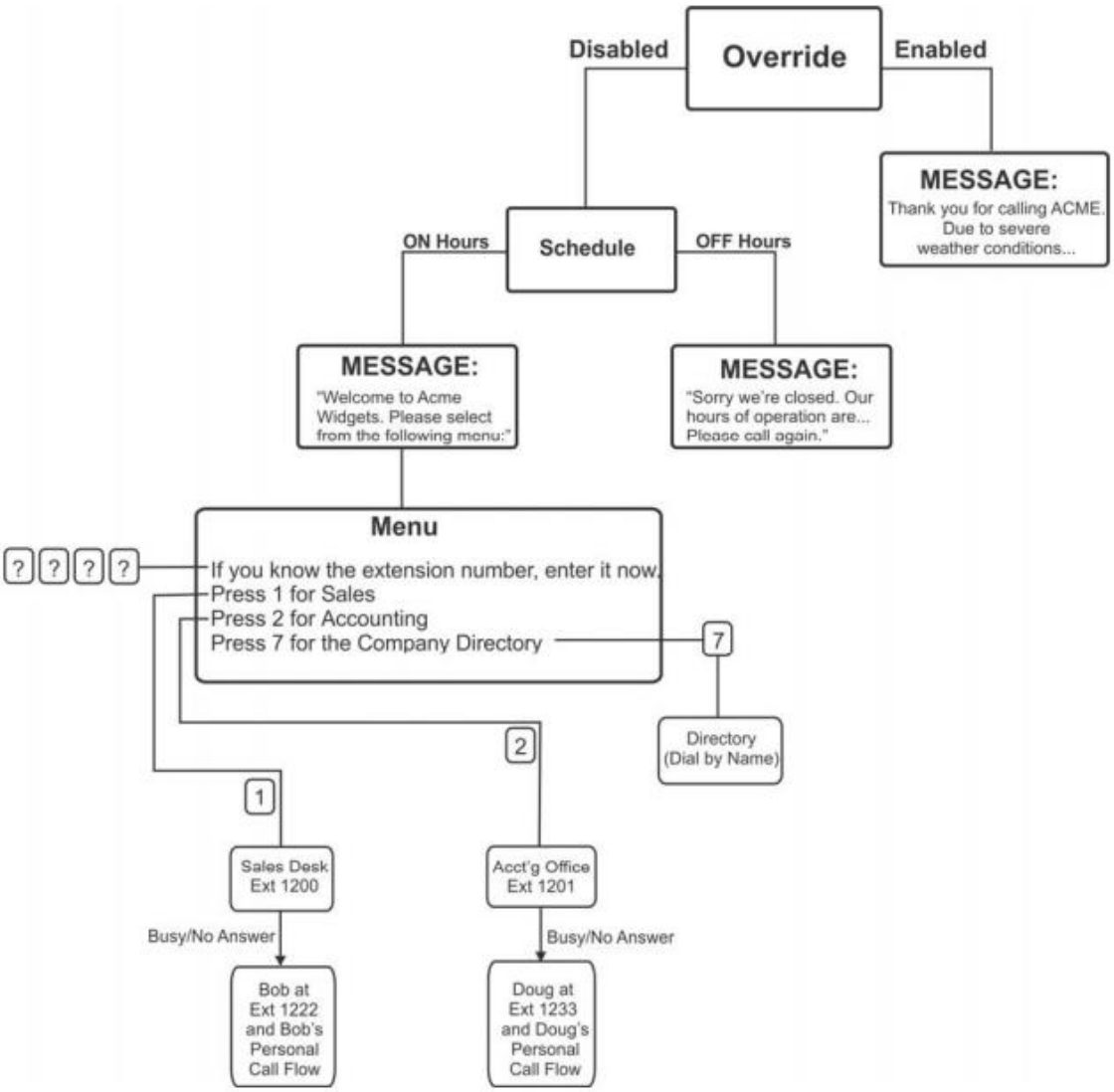
Persons who install, manage and/or operate a MLTS must configure the MLTS' settings so that once installed the MLTS is fully capable of:

- A user dialing 911 directly from any station equipped with dialing facilities as soon as the system is able to initiate calls to the PSTN; and
- Sending 911 call notifications to a central location at the facility where the system is installed or to another person or organization at a different location (e.g., central or other location) if the MLTS is capable of doing so without an improvement to the hardware or software of the system.

FCC 19-76 does not prohibit indirect dialing of 911 (e.g., 9911) provided that direct 911 is enabled.

MiVoice Business PBXs licensed in the United States contain a setting that allows the business to enable users to directly dial 911 (i.e., without dialing any additional digit, code, prefix or post-fix) from any station equipped with dialing facilities as soon as the system is able to initiate calls to the PSTN.

	MiVoice Business PBXs licensed in the United States can be configured by the business to provide phone and console-based 911 alerts consisting of a visual display and a tone. The alert is capable of being sent to up to 32 phones and consoles. The alert, which contains the time and date of the call, the caller's extension number and a configurable description of the caller, is initiated contemporaneously with a 911 call and does not delay the call. ***These alerts are expanded with the capabilities of Mitel Revolution (Included in base proposal)***
S5	DID numbers for extensions **Fully compliant – existing or new DIDs can be tied to specific extensions. These are commonly matched with the extensions (i.e. 217-384-3776 for the main line is simply 3776 internally)**
S6	Caller ID **Fully compliant – our solution supports incoming CLID (Calling Line Identification) and CLID with Name (Caller ID Number & Name). CLID Number & Name requires this feature from the SIP/PRI provider – this is commonly included at no additional cost.**
S7	Three-way calling **Fully compliant – base proposal meets & exceeds requirements. We support Ad-Hoc calling of up to 8 way calling.**
S8	Call waiting **Fully compliant**
S9	Unconditional call forwarding **Fully compliant**
S10	Auto attendant/phone trees (with scheduling) **Fully compliant, we have proposed 20 Auto Attendants – 1 per department. This can be easily configured on a department by department basis (if there are different times/greetings/schedules). With our visual NuPoint Call Director, this can be logically changed by users who do not require technical expertise. Some screen shots have been included below for reference.**


Override
Disabled
Enabled
MESSAGE:
Thank you for calling ACME. Due to severe weather conditions...
Schedule
ON Hours
OFF Hours
MESSAGE:
"Welcome to Acme Widgets. Please select from the following menu:"
MESSAGE:
"Sorry we're closed. Our hours of operation are... Please call again."
Menu
? ? ? ?
If you know the extension number, enter it now.
Press 1 for Sales
Press 2 for Accounting
Press 7 for the Company Directory
7
Directory (Dial by Name)
2
1
Sales Desk Ext 1200
Acct'g Office Ext 1201
Busy/No Answer
Busy/No Answer
Bob at Ext 1222 and Bob's Personal Call Flow
Doug at Ext 1233 and Doug's Personal Call Flow

2. In the Results area for the Override, click the Message Center action beside **Disabled**

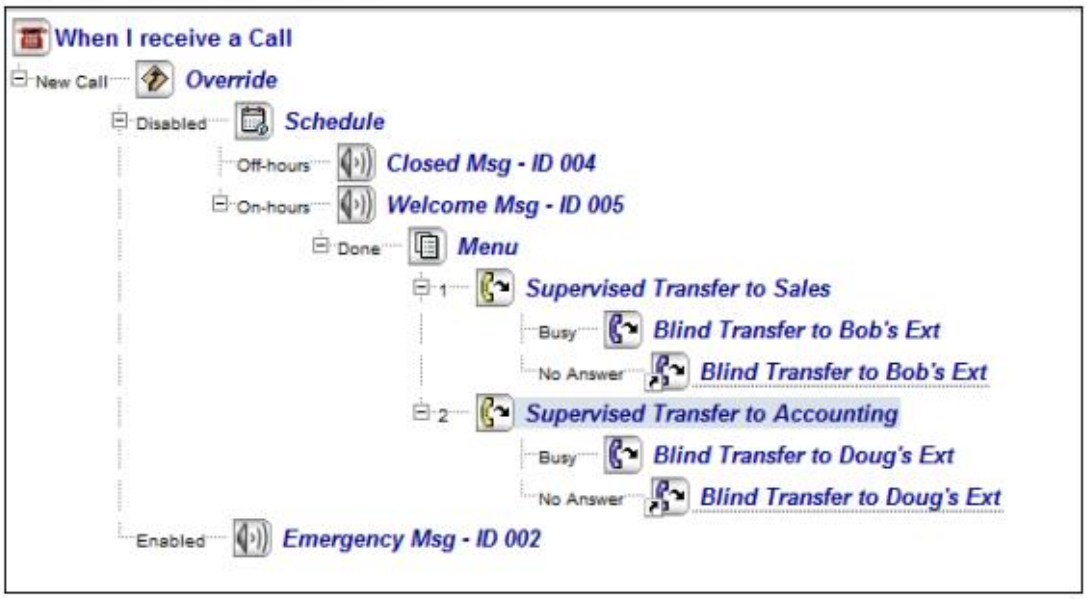
Results for *Override*	
Result	Destination Action
Disabled	Message Center
Enabled	Message:Emergency Msg - ID 002
From Call Flow	Unassigned
Extended Absence	Unassigned

3. In the New Actions list, select **Schedule**. Now you need to tell Call Director which hours are "On" and "Off". (Tip: Think of "On hours" as "On Duty" hours.)

4. In the Schedule properties window, click **Weekly Schedule** and select the "On" hours:

5. Click **Add**. The programmed weekly schedule is displayed:

Day	Start Time	End Time	Action
Monday	09:00 AM	05:00 PM	Delete
Tuesday	09:00 AM	05:00 PM	Delete
Wednesday	09:00 AM	05:00 PM	Delete
Thursday	09:00 AM	05:00 PM	Delete
Friday	09:00 AM	05:00 PM	Delete

	
S11	Hunt groups - Ring all (all available agents) **Fully compliant**
S12	Hunt groups - Round-robin (longest idle) **Fully compliant**
S13	Hunt groups- Linear hunt- (available agents in predefined order) **Fully compliant**
S14	Hunt groups - Linear cascade – (groups of agents in predefined order) **Fully compliant**
S15	Music on hold **Fully compliant** **MiVoice Business Flexible Music On Hold (MOH)** The MiVoice Business Music on Hold (MOH) feature provides callers with music or information while they are waiting for their call to be completed. This feature is provided when a call is on hold, transferred to a busy party or in message-waiting status. The music or information source is customizable. MiVoice Business enables MOH to be provided through analog, digital and embedded connections. The analog and digital connections provide music from off-board sources. Embedded messaging enables music or information to be downloaded from a preferred source to a WAV format. Live music also can be played for MOH by using a SIP-based G.711 stream on the network as a live MOH source. This option is available on MiVoice Business on ISS, MiVoice Business VMware Virtual Appliance and MiVoice Business Multi-Instance platform-based deployments. In a tenanted environment, tenants can each have their own MOH source, up to 65 embedded sources.

	Embedded voicemail also provides the capability to support recorded announcements. These can be played as a general greeting to callers or within Automatic Call Distribution (ACD) queues or while on hold. To give greater flexibility, independent MOH sources can be assigned using Zone number or Call Coverage Index. The Zone number is analogous to location. As a result, all users in a given location could be provided a distinct music source. A Call Coverage Index will be provided to individual directory numbers. With this, given calls being answered from a given Ring Group (as opposed to legacy Hunt Group) will be provided music independent of the Controller, Zone or User that places the call on hold. ***MiVoice Business: Examples of Possible Messages to Customers*** 
S16	Message on hold **Fully compliant, this would be handled the same as Music on Hold. If the County is inquiring specifically about ACD related messages on hold, we also support RADs (recorded announcement devices) that would allow a message to be played (e.g. thank you for continuing to hold for the Judicial Records department, your call is important to us and will be answered in the order received).**
S17	Unified messaging **Fully compliant, our solution supports basic (SMTP forwarding with or without attachment, no synchronization), standard (delivers a hyperlink and subject header to users' inbox to stream the audio from the voicemail server, synchronization after playback with MWI) and advanced Unified Messaging (full integration with email environment – allows Microsoft 365 to handle message storage with full synchronization of MWI) – all deployment types are included with the UCC Standard user licenses.** **All users will also have access to visual voicemail – both on the physical phone as well as playback from MiCollab Client PC/MAC/WEB/MOBILE.** **TIG Recommendation: the preferred method of deployment for Government and Education is Standard**

	Unified Messaging. This is specifically due to the eliminating the burden of FOIA and message retention requirements as a Government agency. Currently, most legal review does not require voicemail to be subject to FOIA requests. As soon as an attachment is made to an email in O365, that voicemail attachment becomes an email and is subject to FOIA. By implementing Standard Unified Messaging, only the message header and link to the audio file are contained within the email. Once the message is deleted, the hyperlink would be dead. The hyperlink would also have security permissions, so no one without appropriate access would be able to access the recording.
S18	Support for analog devices **Fully compliant. Our solution supports analog devices in a variety of different ways. As proposed, we have included the appropriate number of ATAs (Analog Terminal Adapters) based on the table provided as part of the Vendor Q&A.** **If deploying optional Mitel 3300 Gateways, we can also use traditional cards or built-in ports. The provided option for Mitel 3300 CX II gateways would include 4 Analog Station ports and 6 Loop Start trunk ports per gateways, with the ability to expand as needed.**
S19	Phone twinning **Fully compliant. Our solution meets and exceeds this requirement for all users. The UCC Standard license includes a multi-device user license and our MiCollab Client with softphones. We can setup simple twinning – ring a users' personal ring group of 1 to 8 devices whether internal or external physical or softphones. We can also allow users to ring specific device(s) based on their availability and integrate this with their O365 calendar or manual updates to their Presence (Status). For example: in the office may ring a users' desk phone and PC softphone, while out of the office status may ring a users' mobile softphone, mobile phone, etc.**
S20	Conference Calling - up to 5 participants **Fully compliant. Our solution natively supports ad-hoc calling of up to 8 participants. Our solution also includes Audio/Web/Video conferencing of up to 73 (note: this would be dependent on available trunks and bandwidth)**
S21	Ability to configure outbound Caller ID **Fully compliant. On outbound calls, we can choose to show the main number, the specific DID of phone, a department number, any other number the County owns, or block the number. Often times, we find that certain individuals and departments do not want to publicize individual DIDs (e.g. Public Defenders, Sheriff's department, Judges, etc.)**
S22	Softphone/application support (for Windows and mobile OS) **Fully compliant. Our MiCollab with softphone application supports Windows, Mac, Web and Mobile (native clients available in the Apple/Google store for Android/iOS and is end-user self-deployable with QR codes)**

PHONE	
P1	Built-in speakerphone **Fully compliant. All of our proposed phones have a high quality full-duplex speakerphone using Mitel Hi-Q Audio Technology**
P2	Headset compatibility **Fully compliant. All of our proposed phones are headset capable. The proposed 6920w provides Bluetooth and USB headsets support and features and innovative analog headset port that uniquely provides dual support for DHSG and modular 4-pin headset connections. The solution supports a wide variety of industry standard headsets and Mitel headsets. A list of recommended Mitel headsets can be**

	found in our Detailed Equipment Itemization Section 10.
P3	Unheard voicemail message indicator (by light or display) **Fully compliant. Unheard voicemail Message Waiting Indicator (MWI) can be displayed visually with both display and a dedicated LED for call and message waiting indication.**
P4	Staff directory **Fully compliant. Staff directory can be accessed from Corporate Directory which is available on the phone directory. Note: a personal directory of contacts and a mobile directory of contacts (integration with Mobile Pairing via Bluetooth) is also available. Finally, corporate directory can also be integrated with the MiCollab Client softphone directory. This can be easily searched by name or number.**
P5	Call hold **Fully compliant.**
P6	Call parking **Fully compliant.**
P7	Do not disturb **Fully compliant.**
P8	Distinctive ringing **Fully compliant. Internal and External ringing can be differentiated with various available ringtones**
P9	Speed dial/memory buttons **Fully compliant. End user programmable speed dial keys can be programmed (if allowed) as well as system speed dials (shared across the network)**
P10	Redial button **Fully compliant.**
P11	Call pickup for different extension **Fully compliant.**
P12	Call pickup for hunt group **Fully compliant.**
P13	Call transfer to a phone extension **Fully compliant.**
P14	Call transfer directly to an extension's voicemail **Fully compliant.**

VOICEMAIL	
V1	Announce and/or display time and date of call **Fully compliant.**
V2	Announce and/or display extension or number of caller **Fully compliant.**
V3	Ability to save/archive message **Fully compliant.**
V4	Ability to delete message

	Fully compliant.
V5	Ability to forward/copy message to different extension/user **Fully compliant.**
V6	Ability to forward/copy message with annotation to different extension/user **Fully compliant.**
V7	Ability for recipient to receive email notification of voicemails w/ audio file attached **Fully compliant. Please review S17 recommendation.** **"Fully compliant, our solution supports basic (SMTP forwarding with or without attachment, no synchronization), standard (delivers a hyperlink and subject header to users' inbox to stream the audio from the voicemail server, synchronization after playback with MWI) and advanced Unified Messaging (full integration with email environment – allows Microsoft 365 to handle message storage with full synchronization of MWI) – all deployment types are included with the UCC Standard user licenses.** **TIG Recommendation: the preferred method of deployment for Government and Education is Standard Unified Messaging. This is specifically due to the eliminating the burden of FOIA and message retention requirements as a Government agency. Currently, most legal review does not require voicemail to be subject to FOIA requests. As soon as an attachment is made to an email in O365, that voicemail attachment becomes an email and is subject to FOIA. By implementing Standard Unified Messaging,"**
V8	Ability to retrieve voicemail remotely **Fully compliant, voicemails can be accessed through a backdoor number. As a reminder, all users will also have the capability to retrieve messages with MiCollab Client PC/MAC/WEB/Mobile visual voicemail playback.**

TRAINING	
T1	Training – End users **Fully compliant. All End Users will be trained if allowed. We are flexible in our approach to training and will rely on guidance from the Champaign County team on what will work best for specific departments/roles. Ultimately, the better trained the Champaign County end users are, the smoother the transition to the new system will be. As long as the County can fill minimum seats for training, TIG will provide it; in the best method that works for its' users.** ○ **End User training** ▪ Users are trained on working, customer system phones, voicemail, and applications to ensure understanding of all major features and tasks. This will be conducted per the RFP requirements. ▪ TIG's Project Manager will coordinate all training related to the new system cutover. Training is typically "Classroom Style" using live phones; however, we are flexible to accommodate following appropriate health guidelines at the time of training. ▪ Details & frequency of each training session:

	○ Telephone Users - Individuals will be trained on the features they use and how those features interact with company procedures. ○ Class time – 45 minutes ○ Minimum of 20 users per class ▪ Voice Mail Users – Voice mail users will be trained on all aspects of using their mailboxes. ○ Class time – 30 minutes ○ Minimum of 20 users per class ▪ Conference, Collaboration & Mobility Users –will be trained on all aspects of implemented applications purchased by The County of Champaign. ○ Class time – 30 minutes ○ Minimum of 20 users per class ▪ Customized cheat sheets are distributed and will be specific to The County of Champaign's new system and end-user applications deployed along with online user training. ▪ For auditorium style training, The County of Champaign is welcomed to video the classes and distribute the "best" one for additional follow up training.
T2	Training – System Administrators **Fully compliant. Typically, Admin training is held post-cutover and will be done on the County's own system. This is a good opportunity to implement real MACD requests (moves/adds/changes/deletes) in the County's own production environment. TIG Admin training is typically 4-6 hours long and can be as in-depth as the County wishes. Generally, we focus on day to day MACD requests that could be handled by the County if desired.** **If the County wishes to take a more active role in management, we highly recommend consideration of the Mitel Premium Software Assurance Subscription. Mitel Premium Software Assurance offers unlimited Mitel online training at no additional cost and offers some of the same courses that our Mitel Trained technicians go through. These are in depth training sessions, so appropriate time will need to be given to these courses. More information on Mitel Premium Software Assurance with Mitel Training can be found in TAB 6 and pricing in TAB 10 Detailed Equipment Itemization.**

DESIRED SUPPLEMENTAL FEATURES	
SERVICE	
Opt-S1	Support - 24/7, with 4-hour response time **Fully compliant and included for TIG Maintenance. With Mitel Premium Software Assurance, this**

	coverage would extend to Mitel Support 24x7 as well.
Opt-S2	Conference Calling - up to 10 participants **Fully compliant and included for up to 73 participants with Mitel Audio/Web/Video conferencing.**
Opt-S3	Ability to record phone calls **Fully compliant and included. Ad-Hoc voicemail call recording is included for all users. This would deliver a recorded phone call into the users' voicemail box and subsequently Unified Messaging. Recording calls in this way would start the recording at the time a key is pressed on the users' phone.** **OPTION: We also offer a more comprehensive call recording solution with our Mitel Interaction Recording solution powered by ASC. This is sold as bundled tier licenses in both a CapEx and OpEx subscription model. The solution offers search and replay via web browser for indexed call review, integration with Contact Center, G729 data compression, encryption, screen recording, stop/start, emotion detection, and more. Due to not having a specific number of users to be recorded, we cannot provide sizing/pricing until we have additional discovery and discussion with the County.**
Opt-S4	Ability to record conference calls **Fully compliant and included for up to 73 participants with Mitel Audio/Web/Video conferencing.**
Opt-S5	Find me/follow me **Fully compliant and included. Please review S19 for functionality.** **"Our solution meets and exceeds this requirement for all users. The UCC Standard license includes a multi-device user license and our MiCollab Client with softphones. We can setup simple twinning – ring a users' personal ring group of 1 to 8 devices whether internal or external physical or softphones. We can also allow users to ring specific device(s) based on their availability and integrate this with their O365 calendar or manual updates to their Presence (Status). For example: in the office may ring a users' desk phone and PC softphone, while out of the office status may ring a users' mobile softphone, mobile phone, etc." Unanswered calls will be pulled back into the County's voicemail system.**
Opt-S6	Call queues - Round-robin (longest idle) **Fully compliant and included**
Opt-S7	Call queues - Linear hunt- (available agents in predefined order) **Fully compliant and included**
Opt-S8	Call queues - Linear cascade – (groups of agents in predefined order) **Fully compliant and included.**
Opt-S9	Conditional call forwarding - Busy **Fully compliant and included**
Opt-S10	Conditional call forwarding - No answer **Fully compliant and included**
Opt-S11	Extension/group paging and announcements **Fully compliant and included**
Opt-S12	Faxing **Fully compliant. Note: heavy faxing will generally require some tweaking with the SIP provider if delivering over a DID. Often times, specific SIP call paths/channels should be dedicated to faxing to facilitate T.38 rates.**
Opt-S13	Auto-dialer **Fully compliant, but not included. Further discussion is required for sizing purposes. Based on the Vendor Q&A. Depending on whether this process is a manual upload of a list, or integrated with Mitel's Open APIs and Mitel IVR for completely automatic auto-dialing, we can accomplish this in a number of ways. We have experience implementing Health & Human Services appointment reminders as well as Juror inbound advanced IVR integrations at other Counties.** **PREVIEW** • Agent clicks to request the next CRM record to call. • Agent familiarizes him/herself with customer info. • Agent clicks "Dial".

- Agent classifies all calls (including non-productive).
- System automatically recycles non-productive calls for next attempt.
- Agent handles productive calls.

PROGRESSIVE

- Agent is idle for a configurable number of seconds.
- System "pops" the next CRM record on the screen and dials.
- Agent classifies all calls (including non-productive).
- System automatically recycles non-productive calls for next attempt.
- Agent handles productive calls.
- Agent dispositions all calls through the script.

Predictive dialing is a mode of dialing based on advanced mathematical probabilistic algorithms used to reduce the wait time between calls whilst only presenting connected calls to agents. Such connected calls could be to answering machines, unless the technologies available in the Advanced Dialer are used. This product includes patented technology (Script Aware Predictive Dialing) which allows the dialer to remain efficient when teams are smaller in size down to a minimum of 6 agents. This is achieved through intelligent interplay between the dialer and the call scripting modules by tracking each agent's progression through scripts.

The algorithm uses factors such as the list connect rate and the average call handling times to calculate how many calls to dial simultaneously in order to keep agent as busy as possible but maintain the level of abandoned calls under a pre-defined limit. All predictive dialers generate abandoned calls (i.e. occasionally, due to the nature of probability, more calls connect than free agents are available). However, using the SNoDrop™ technology available with the Advanced Dialer license can uniquely resolve this drawback and deliver predictive dialing with 0% abandoned calls.

Summary of the predictive method:

- System over-dials numbers in advance of agents becoming available
- System dispositions automatically non-productive calls (busy, no answer, unobtainable, etc.)
- System automatically recycles non-productive calls for next attempt
- Agent becomes free
- System delivers a connected call and a screen pop simultaneously
- Agent handles productive calls
- Agent dispositions productive calls through the script

Power dialing is a restricted form of predictive dialing where the prediction element is removed and the only benefit, which remains is that agents will only receive connected calls. However, wait time between calls will be longer than in predictive mode. This method is useful when 0% abandoned call rate is required but no MiCC Advanced Dialer is included. Also, power dialing is the method used for unattended dialing installations.

The MiCC Outbound Power/Predictive Dialer license also requires a corresponding MiCC Outbound Preview/Progressive Dialer license.

This license stacks on top of the Predictive Dialer license (which is required for each Advanced Dialer license) and provides additional functionality mostly under patent unique to this product. These include at present:

- **Answer Machine Detection** – a standard method for detecting answering machines and not presenting these calls to agents when in predictive (or power) dialing mode. This is not available with the standard Predictive Dialer license.
- **Live Person Detection (LPD™)**– a patented method using bot technology for preventing calls to answering machines (of all types) from reaching call center agents using predictive dialing. It is a method superior to AMD and unique to Mitel (Noetica). A major selling point.

	• **SNoDrop™** - a method unique to this dialer, which provides full predictive dialing with 0% dropped (abandoned) calls. All other predictive dialers on the market generate abandoned calls so this is a revolutionary new technology and another major unique selling point. The MiCC Outbound Advanced Dialer license requires a corresponding MiCC Outbound Call Manager license as well as a corresponding MiCC Outbound Predictive Dialer license.
Opt-S14	Interactive voice response (IVR) system **Fully compliant, but not included. IVR as described by the Vendor Q&A can likely be handled with our NuPoint automated attendant (e.g. spoken commands instead of pushing specific keys when dialing in). Our IVR capabilities extend far beyond this AA capability and we would like to request further discussion to see how we can best implement a solution that will meet and exceed County expectations. IVR is commonly deployed at other County Government customers.**
Opt-S15	Office-level/department-level billing **Fully compliant, but not included. Most customers have moved away from office-level/department billing with the costs of telephony service rates being relatively low over the past decade. Our solution for this would be Mitel Call Accounting for historical cradle-to-grave reporting of all calls. This provides a who called who, when and for how long on every call inbound and outbound from the system. We also have Mitel Business Reporter which is more commonly used in conjunction with ACD/Contact Center – this provides all historical reporting and real-time reporting.**
Opt-S16	Automated Callback Service **Fully compliant, but not included. Callbacks are a function of our Contact Center/ACD solution. Callbacks need to be sized based on the number of callers typically received, the number of available ACD agents within specific groups allowing for this option, etc. Generally, this is deployed with and IVR system and callers would be presented an option to leave a callback number after a specified hold time in queue. A callback can be presented to ACD agents with callbacks maintaining their position in queue, or a separate callback queue can be created to allow for callbacks as agents come into a slower period.**

PHONE	
Opt-P1	Busy light/lamp **Fully compliant and included. Message Waiting Indicators with external LED as well as display icons are included.**
Opt-P2	Extension monitoring by light/display **Fully compliant and included. We call this DSS/BLF (Direct Station Select/Busy Lamp Field) and this can be programmed on any available phone key. These are color coded and would contain a symbol for some statuses – such as Do Not Disturb. This is further enhanced with our MiCollab Client that provides real-time presence for chat and phone and can be synchronized with a users' O365 calendar for automatic updates.**
Opt-P3	Ability to configure number of rings before an action (e.g., send to voicemail) **Fully compliant and included.**
Opt-P4	Hearing aid compatible **Fully compliant and included. All Mitel telephones conform to FCC regulations for hearing aid compatibility and volume control, per section 508 of the United States Access Board's Electronic and Information Technology Accessibility Standards.** **All proposed phones come with Hearing aid compatible (HAC) handsets. The Mitel 6920w phones also have built-in Bluetooth. Some of our customers have used their BT hearing aids to connect directly to our phones as well.**

Opt-P5	Ability for proposed system to support wireless/cordless phones, allowing roaming throughout buildings **Fully compliant and included. All proposed users (635) UCC Standard will have the capability of using mobile softphones with our MiCollab Client and connecting over 802.11 Wi-Fi or using data connection (4G/5G), with twinning/single number reach users can also use traditional mobile voice networks to stay connected.** **If the County would like to use purpose-built wireless/cordless phones, we also have a variety of 802.11 Voice over Wi-Fi___33 phones that can be deployed.** **For more local area phones (commonly deployed in libraries and records departments), we also offer purpose-built wireless/cordless that operate with as SIP phones and connect over proprietary DECT base station antennas. This can be deployed as a single DECT cell solution or networked as a parallel network to the County's wireless.** **Finally, we have the option to add Bluetooth cordless handsets, Bluetooth cordless headsets and DECT wireless headsets to individual user phones in the 6900 series family of IP phones.**
Opt-P6	Ability for staff members to take office phone home and use it remotely **Fully compliant and included. The included UCC Standard user licenses for all users include (2) Teleworker licenses. One of these is designed for each users' softphone and the other for their desktop phone.** **Note: many home users do not have their router/modem/all in one next to where they would want a phone. Throughout the pandemic, we were not able to keep up with the demand for Wireless LAN adapters for our phones and they were frequently on backorder. To address this issue, the Mitel 6900w family of phones was introduced which upgraded the previous generation's chipset to include both Bluetooth and Wi-Fi___33 – allowing users to connect to their home Wi-Fi network. All proposed phones are Wi-Fi dual band (2.4GHz/5GHz) 802.11 a/b/g/n and can be easily connected to a home or remote office network.**

VOICEMAIL	
Opt-V1	Forward/copy message to multiple extensions **Fully compliant and included.**
Opt-V2	Forward/copy message with annotation to multiple extensions **Fully compliant and included.**
Opt-V3	Ability for recipient to receive email notification of voicemails w/ audio file attached and with transcription of message. **Fully compliant, but optional. Our solution can provide transcription services, this is based on the number of users subscribing to this service. The pricing scales depending on how may users are being transcribed.**

Ancillary Questions

Proposals should address the below questions.

A. Platform Questions

1. Does the vendor develop and maintain the platform solution in-house, or does it resell another vendor's solution? **Telcom Innovations Group is an exclusive Gold Mitel Networks Business Partner. Mitel does not sell directly and uses channel partners to install and maintain their UC solutions. TIG consistently ranks among the top 1% in the world for State & Local Government + Education and has been awarded with extensive Mitel awards and recognition.**

2. What is the product name and version/level being supplied? **Our core solution is the Mitel MiVoice Business. Currently the latest release is version 9.4.**
3. On average, how often are updates/upgrades for the software released? **Typically, Mitel releases major updates about every 12-18 months, with 2 – 3 minor releases during the same period. There is no set schedule for releases.**
    a. Are there any costs associated with the upgrades? **With Mitel Software Assurance, the major and minor software releases are included as part of the subscription. The labor from TIG to perform the installation/upgrade of software varies from release to release depending on any new features that may be introduced.**
4. How and where is voicemail stored? **With most Government customers, our recommendation is to retain the voicemails on the MiCollab NuPoint voicemail server. See S17 and V7 responses regarding FOIA recommendations. The County ultimately has the choice to deploy any type of Unified Messaging. With Simple and Standard, the voicemail is stored on the MiCollab NuPoint voicemail server. With Advanced integration, the message would be stored on the O365 server.**
    a. How is it secured? **To secure voicemail for applications such as Teleworker and NuPoint Unified Messaging, Mitel uses its own secured and tempered version of Linux that includes protection against denial-of-service (DoS) attacks. In this version of Linux, Mitel removed unnecessary services. For frequently attacked services, such as Domain Name System (DNS), Mitel replaced common Linux components with more secure alternatives. The system also includes elements such as logging and a robust stateful firewall.**

       For unified messaging, the MiCollab Unified Messaging user may be prompted to set up a PIN upon first login. Security policies will not allow for simple PINs (e.g., 1234). If the PIN has been set up through the administration interface, it will, by nature, be defined as weak and the user will be redirected to MiCollab unified messaging and guided through the PIN reset process.

       MiVoice Business Security

       MiVoice Business call management software has been designed with a security-by-design mindset with security features that address identity, authentication, encryption, access, and authorization. When activities affect a specific operation, procedure or event within a company, it is important to have the ability to capture the sequence of such events. Audit logs can be utilized to reconstruct events, detect intrusions, and analyze problems such as poor performance or unexpected system behavior. These can provide improve company security policies and reinforces the enterprise security to deliver a relevant security record.

       The MiVoice Business solution follows the open standards and access mechanisms for system security, with:

       - **Transport Layer Security (TLS). Secure access to IP Phones and secure signaling between IP Phones and the MiVoice Business service nodes. TLS provides secure web access to MiVoice Business Service Nodes.**
       - **Secure Shell (SSH). Secure console-based access to IP Phones and the MiVoice Business system administration and configuration tools.**
       - **Secure Real-time Transport Protocol (SRTP) protects the voice media streams between IP Phones and between IP Phones and the MiVoice Business.**
       - **Configuration, identity and access management policies ensure all end user and administrator accounts, roles, permissions and password policies.**

       Other mechanisms that can be employed to protect the MiVoice Business system are a securely designed corporate Local Area Network (LAN) infrastructure and configuration of internal and external public facing routers and firewalls.

       The IT data infrastructure must be designed with security mechanisms and protocols in-place. In addition to any security recommendations, there are a number of general security aspects that will be addressed with system administrator and/or IT security officer. It is equally

important to maintain physical security measures within the organization to limit only authorized personnel access to server locations since data attacks can be increased by physical access to the host.

b. What is the maximum storage capacity (per user and for the entire system)?
This is definable and configurable by user and system.
- **Maximum number of messages allotted per user**
- **Maximum message length**
- **Days to keep read messages**
- **Days to keep unread messages**
- **Message File Format used**
- **The message file format typically deployed is G711. G711 file format is approximately 8000 Bytes/Sec, 480,000 Bytes/min = 28.8 MB/Hour. The minimum required system storage capacity is 160 GB, but this could be substantially more. This could be thousands or tens of thousands of hours of storage.**

5. If applicable, how and where are recorded calls stored? **With included NuPoint Voicemail ad-hoc recording, these would be stored the same way as the County's voicemails are configured to be stored.**

With Opt S3 – Mitel Interaction Recording Option – these would be stored on the Mitel Interaction Recording Server

a. How are the recorded calls retrieved? **With included NuPoint Voicemail ad-hoc recording, these would be retrieved in the same manner as voicemails are setup to be retrieved.**

With Opt S3, these would be retrieved with Mitel Interaction Recording Search and Replay web browser or application.

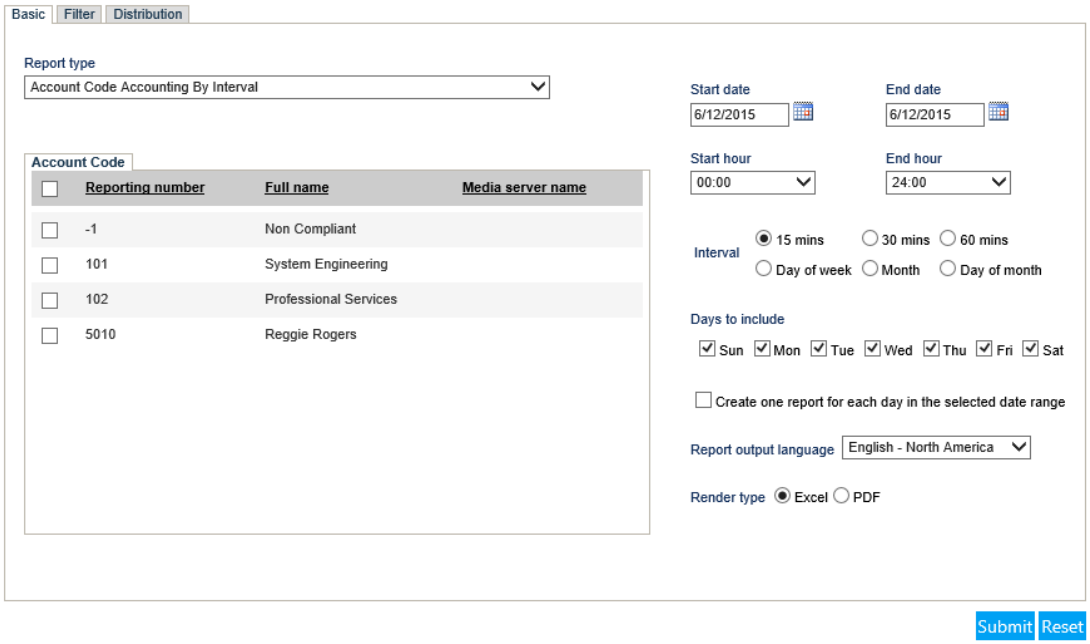
b. How are they secured? **With included NuPoint Voicemail ad-hoc recording, these would be secured on the MiCollab NuPoint server application and accessible with user authentication.**

With Opt S3, these would be secured on the Mitel Interaction Recording server with 256-bit AES.

6. What are the different reporting options available on the system (e.g., usage, billing, call history, etc.)? **With Opt S15, the Mitel Call Accounting Report options is comprehensive and too long to list all of the available options and details. The Call Accounting Reports guide is 320 pages and can be found here:** https://www.mitel.com/document-center/applications/analytics/mivoice-analytics/91/en/mivoice-analytics-call-accounting-reports-guide

Mitel Call Accounting is complete cradle to grave reporting for all calls. This includes usage, billing, call history, queue reports, extension reports, trunk reports, traffic and trunk reports, account code reports, ANI reports, employee reports, employee division reports, DNIS reports, phone number reports, subscriber reports, extension division reports, etc. These are definable by Report type, device field, start date/end date, start hour/end hour, days to include, interval by 15/30/60 minutes, report mode spanning a specific length of time, email, print or .csv/pdf. These can be on demand reports or scheduled to be sent to specific emails at pre-defined time intervals.

a. Please include samples.
The Call Accounting Reports guide is 320 pages and can be found here:
https://www.mitel.com/document-center/applications/analytics/mivoice-analytics/91/en/mivoice-analytics-call-accounting-reports-guide



Activity period	ACD calls handled	Non ACD calls handled	Calls abandoned	Calls outbound	Calls transferred to extension	Calls transferred from extension	Conference calls	Inbound Account Code count	Outbound Account Code count	Average speed of answer (hh:mm:ss)	Average time to answer NonACD call (hh:mm:ss)	Average delay to abandon (hh:mm:ss)	ACD handling time (hh:mm:ss)	Average ACD handling time (hh:mm:ss)	Non ACD handling time (hh:mm:ss)	Average non ACD handling time (hh:mm:ss)	Outbound handling time (hh:mm:ss)	Average outbound handling time (hh:mm:ss)
9	0	0	0	0	0	0	0	0	0	00:00:00	00:00:00	00:00:00	00:00:00	00:00:00	00:00:00	00:00:00	00:00:00	00:00:00
10	45	172	6	95	88	95	1	0	0	00:00:06	00:00:02	00:00:11	05:11:34	00:06:55	05:15:06	00:01:50	10:19:59	00:06:32
11	36	152	11	128	82	98	1	0	0	00:00:05	00:00:02	00:00:09	08:31:56	00:14:13	06:20:58	00:02:30	08:19:25	00:03:54
12	36	141	13	151	73	87	0	0	0	00:00:05	00:00:02	00:00:12	09:13:33	00:15:23	04:54:46	00:02:05	11:47:50	00:04:41
13	0	0	0	0	0	0	0	0	0	00:00:00	00:00:00	00:00:00	00:00:00	00:00:00	00:00:00	00:00:00	00:00:00	00:00:00
14	0	0	0	0	0	0	0	0	0	00:00:00	00:00:00	00:00:00	00:00:00	00:00:00	00:00:00	00:00:00	00:00:00	00:00:00
15	39	151	6	135	52	92	7	0	0	00:00:07	00:00:02	00:00:04	07:32:08	00:11:36	03:56:10	00:01:34	12:45:37	00:05:40
16	17	172	28	114	68	92	0	13	0	00:00:06	00:00:02	00:00:09	05:30:23	00:19:26	05:46:39	00:02:01	13:47:18	00:07:15
Totals	173	788	64	623	363	464	9	13	0	00:00:06	00:00:02	00:00:09	35:59:34	00:12:29	26:13:39	00:02:00	57:00:09	00:05:29

Figure 12: Voice Extension Group Performance by Day of Month

Reporting	Full name	Total calls	Total costs	Total duration (hh:mm:ss)	Average cost	Average duration (hh:mm:ss)
2	QA&CS	73	$9.92	06:24:45	$0.14	00:05:16
1	Division 1	18	$0.16	00:52:58	$0.01	00:02:57
Totals	2	91	$10.08	07:17:43	$0.11	00:04:49

Figure 106: All Employee Division Billing by Employee Division

Reporting	Full name	Total calls	Total costs	Total duration (hh:mm:ss)	Average cost	Average duration (hh:mm:ss)
13	Hr/Admin	12	$0.12	00:03:23	$0.01	00:00:17
12	FrameWork	34	$0.18	00:14:41	$0.01	00:00:26
15	Finance	8	$0.21	00:32:26	$0.03	00:04:03
10	Applications Team	50	$0.39	01:03:11	$0.01	00:01:16
9	IT	17	$0.57	00:16:52	$0.03	00:01:00
5	Professional Services	19	$0.71	00:37:10	$0.04	00:01:57
14	Execs	32	$1.03	06:15:25	$0.03	00:11:44
2	QA	81	$1.18	03:22:14	$0.01	00:02:30
6	Training	38	$1.35	00:49:25	$0.04	00:01:18
4	PM	22	$3.27	01:19:19	$0.15	00:03:36
7	Sales	299	$13.89	36:40:49	$0.05	00:07:22
1	CS	322	$14.53	56:55:36	$0.05	00:10:36
11	IQ Team	60	$175.37	03:28:22	$2.92	00:03:28
Total		**994**	**$212.80**	**111:38:53**	**$0.21**	**00:06:44**

Figure 108: Employee Division Billing by Employee Group

REPORT FIELD	DESCRIPTION
Call start time	the date and time of the initiation of the call
Number dialed	the inbound/outbound digits dialed
Location	the location of the call
Call type	the call type is determined by the carrier plan and the digits dialed
Duration	the total length of the call
Cost	the cost of the telephone call
Usage Billing option	the Billing options assigned to the subscriber plan, when not applied to a subtotal
Usage Billing percent	the Simple percent markup assigned to the subscriber plan, when not applied to a subtotal
Cost	the sum of the usage charges multiplied by the Usage Billing percent
Service Charge option	the Surcharge amounts assigned to the subscriber plan
Cost	the service charges, based on the Surcharge amount assigned to the subscriber plan
Subtotal Billing option	the Billing options assigned to the subscriber plan, when applied to a subtotal
Subtotal Billing percent	the Simple percent markup assigned to the subscriber plan, when applied to a subtotal
Cost	the sum of Usage, Usage Billing option, and Service Charge option costs, multiplied by the Subtotal Billing percent

Call start time	Extension	Phone Number	Location	Call type	Call rate	Total duration (hh:mm:ss)	Total costs	Trunk	DNIS	Account Code	Third party	Third Party Device type	Caller ID
11-10-2013 12:58:46 PM	1258	6135925660	Kanata, Ontario	Local outbound	LocalOut	00:26:45	$0.30	8112					6135925660
11-16-2013 2:39:30 PM	1258	1110	1110	Internal	internal	00:00:09	$0.00	9999					1110
Totals						00:26:54	$0.30						

Figure 115: Subscriber Billing Trace

Division Name	Employee Group Name	Reporting	Full name	Total calls	Total costs	Total duration (hh:mm:ss)	Average cost	Average duration (hh:mm:ss)
Division 1	QA	1107	Chris Cott	5	$0.00	00:25:17	$0.00	00:05:03
		1121	Vlad Doss	10	$0.06	00:19:49	$0.01	00:01:59
		1135	Brett Dern	3	$0.10	00:07:52	$0.03	00:02:37
		Subtotal		18	$0.16	00:52:58	$0.01	00:02:57
	Subtotal			18	$0.16	00:52:58	$0.01	00:02:57
QA&CS	CS	1119	Mike Crick	24	$9.76	03:21:41	$0.41	00:08:24
		1125	Nick Platt	12	$0.00	00:13:45	$0.00	00:01:09
		1146	Trevor Cillis	1	$0.00	00:02:34	$0.00	00:02:34
		1159	Eric Turt	8	$0.00	00:55:35	$0.00	00:06:57
		1234	Marc Lerit	3	$0.00	00:00:47	$0.00	00:00:16
		1236	Joss [illegible]	7	$0.00	00:57:25	$0.00	00:08:12
		Subtotal		55	$9.76	05:31:47	$0.18	00:06:02
	QA	1107	Chris Cott	5	$0.00	00:25:17	$0.00	00:05:03
		1121	Vlad Doss	10	$0.06	00:19:49	$0.01	00:01:59
		1135	Brett Dern	3	$0.10	00:07:52	$0.03	00:02:37
		Subtotal		18	$0.16	00:52:58	$0.01	00:02:57
	Subtotal			73	$9.92	06:24:45	$0.14	00:05:16
Totals				91	####	07:17:43	$0.11	00:04:49

Figure 107: All Employee Division Billing Detailed

b. Does the system allow for department-level/office-level reporting?

Yes, this is included with Mitel Call Accounting Opt S15

If the platform is hosted: **N/A**

1. Where is the infrastructure located?
2. Is it centrally hosted or geographically distributed?
3. What is the historical up-time over the last 36 months?
4. What business continuity / system survivability options are in place?
    1. E.g., what happens to customer's phone service in the event of a local power or WAN outage at your location?
5. Please describe platform security measures. How is call data protected?

B. Support Questions

1. What are your technical support hours? **Live answer Monday through Friday 8-5 CST, 24x7x365 available with on-call technicians. TIG Maintenance**

TIG Maintenance Support ***(Included Year 1 with pricing for Years 2 through 5)***

- All Parts
- All Labor
- 24 X 7 X 365 remote and on-site support for a major outage
- Installation of required patches for proper operation of telephone and voice Mail systems.
- 30 minutes of Free remote programming per day
- Ongoing consultation to assure both system and users optimum working conditions
- TIG Maintenance provides extended coverage on all TIG provided hardware & software.
- As an Option, multiple years may be prepaid for TIG Maintenance at a discounted rate.

   a. If not included, is there an option to upgrade to 24/7 support? **Included**
2. Do you provide a Service Level Agreement? **Yes, a copy of our TIG Maintenance Agreements has been included.**
   a. If so, please summarize and/or include a copy. **Included**
3. What is your average resolution time for incidents, events, and problems? **Our average time to answer is <17 seconds Monday through Friday 8-5 CST. Typical after-hours coverage is generally <25 minutes. Typical resolution is dependent on the issue, most minor requests are handled within 1 business day.**

C. Equipment Questions

1. Do the provided phones offer pass-through Ethernet ports? **Fully compliant and included for all phones.**
   a. If so, please include the specifications (e.g., port speeds, etc.) **Each phone has Dual Gigabit L2 passthrough Ethernet ports. This allows for a converged network with a PC connected behind a phone over the same ethernet cable.**

2. Are additional phones procured in the future only able to be obtained through the vendor? **Phones are only warrantied and available through authorized partners. With Sourcewell contract pricing, as the partner of record, TIG will have access to the best available pricing for the County.**

3. Does the solution/system being proposed require specialized networking features/functions?
   a. If so (e.g., PoE, QoS, etc.), please include specifications. **Best practices implements PoE and QoS on the voice VLAN. Please see our TIG LAN/WAN guidelines for best practices. Our project management team will review data networking requirements with the County IT administration during our network requirements meeting.**

4. How does the equipment accommodate those with disabilities (e.g., vision/hearing/mobility impairment)?
All Mitel telephones conform to FCC regulations for hearing aid compatibility and volume control, per section 508 of the United States Access Board's Electronic and Information Technology Accessibility Standards.

All proposed phones come with Hearing aid compatible (HAC) handsets. The Mitel 6920w phones also have built-in Bluetooth. Some of our customers have used their BT hearing aids to connect directly to our phones as well.

The MiVoice Business system supports TTY devices for people with hearing or speech disabilities to send and receive text messages over telephone networks.

Mitel is committed to making our products accessible and user-friendly to everyone either by design or through compatible use with assistive technology. We believe that accessible products will benefit all users, with or without physical limitations, and that all users should have the ability to communicate using the best technology has to offer by identifying global accessibility and usability requirements and establishing a process to integrate accessibility.

Web Content Accessibility Guidelines 2.1

Web Content Accessibility Guidelines (WCAG) is developed through the W3C process in cooperation with individuals and organizations around the world, with the goal of providing a single shared standard for web content accessibility that meets the needs of individuals, organizations, and governments internationally. Mitel meets WCAG 2.1. and AA standards for text, images, and sounds code or markup that defines structure, presentation, etc. for web pages or applications.

Twenty-First Century Communications and Video Accessibility Act

Mitel meets the US Communications and Video Accessibility Act (CVAA), ensuring the accessibility for advanced technologies, including new digital, broadband, and mobile innovations.

The Accessibility for Ontarians with Disabilities Act

The Accessibility for Ontarians with Disabilities Act (AODA), is a law that sets out a process for developing and enforcing accessibility standards in Ontario, Canada. Persons with disabilities and industry representatives work together with the government to develop the standards. Mitel commits to AODA and updates the certificate every year. The report and confirmation number are available upon request.

Voluntary Product Accessibility Template

Mitel uses the global Voluntary Product Accessibility Template (VPAT) standard for reporting compliance. VPAT is the leading global reporting format for assisting buyers and sellers in identifying information and communications technology (ICT) products and services with accessibility features. These are the VPAT variation Mitel reports against:

- VPAT 2.4 Rev 508: Revised Section 508 standards – the U.S. Federal accessibility standard
- VPAT 2.4 Rev EU: EN 301 549 – the European Union's "Accessibility requirements suitable for public procurement of ICT products and services in Europe"
- VPAT 2.4 Rev WCAG: WCAG 2.1 or ISO/IEC 40500 (equivalent to WCAG 2.0) and WCAG2.1, W3C/WAI's recently updated Web Content Accessibility Guidelines
- VPAT 2.4 INT: Incorporates all three of the above standards

https://www.mitel.com/-/media/mitel/file/pdf/accessibility/ip-phone-6900-series-vpat-24rev-int.pdf

D. System Management

1. How is the system managed/administered?

All administration access is permission based with logs.

User Desktop Tool Interface provides a simple task-oriented user interface. Users can configure IP devices on their own with communications options such as feature keys, personal directories, call forwarding, and Internet bookmarks. Group Administration Tool is ideal for local administrators responsible for groups or departments. The tool allows a group administrator to add, change, and delete users as well as manage group features such as extension and pick-up groups.
System Administration Tool is designed for technicians and support personnel to configure system attributes. It also provides access to local diagnostics, maintenance commands, logs, and alarms. The tool supports scheduling and range programming, allowing the administrator to program repetitive areas of the system using a single command.

Embedded System Management

MiVoice Business Embedded System Manager (ESM) offers sophisticated ways to monitor and react to problems.

Single Sign-On and Reach Through

ESM will enable the County to manage multiple MiVoice Business platforms from a central location. By logging on to a single platform, an administrator can manage the capabilities of up to 19 MiVoice Business platforms in the administration group without repeating the login process each time. This will greatly reduce the time users spend moving around the solution to find the relevant administration forms.

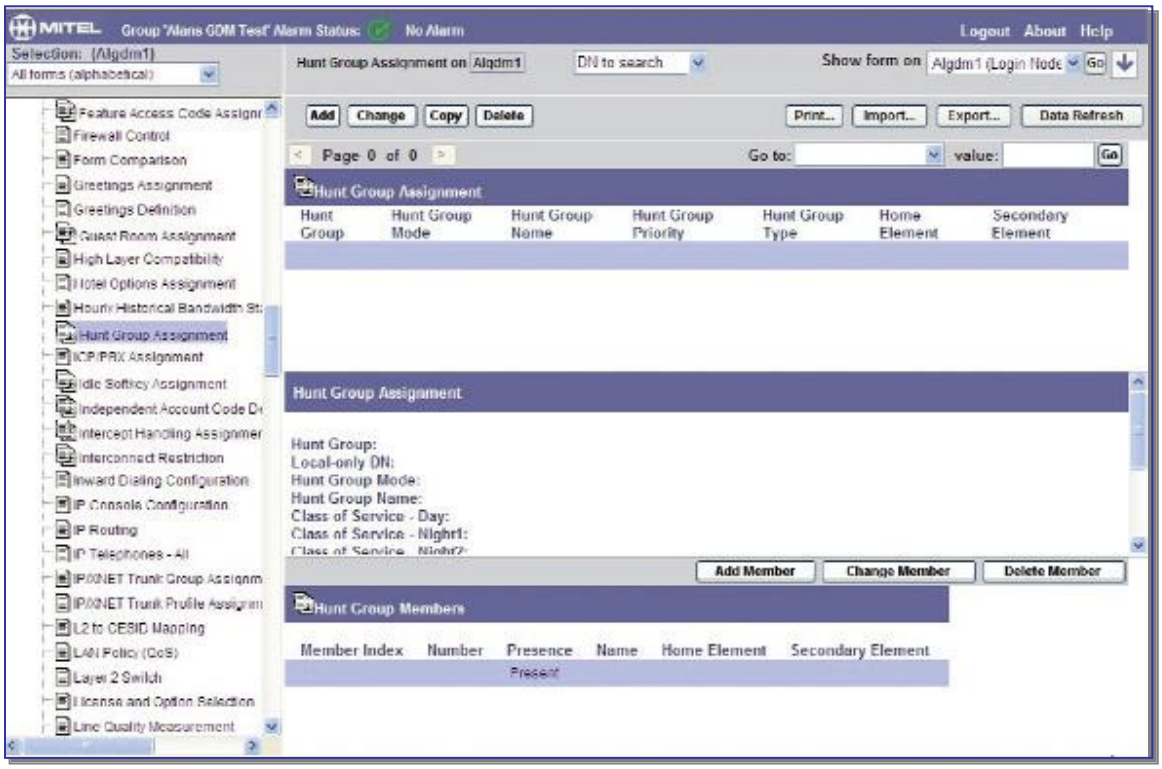
Simply clicking on an extension, for example, will route the administrator to the relevant platform. From there, the administrator can "reach through" to the other platforms in the group to perform all updates as necessary. SDS shares data between members of the administration group, as appropriate.

Access security is maintained as MiVoice Business validates the administrator's password and login ID for each platform.

Administration Tools

ESM includes the following administration and configuration tools. They can be accessed by any Internet Explorer-enabled client PC on the LAN/WAN and use SSL security for data encryption.

a. Please include screenshots of the administration interface.



Viewing ESM Forms for All MiVoice Business Instances in a Group

b. Please describe/provide an exhaustive listing of what tasks can be performed through the systems administration interface.

Group Administration Tool

The Group Administration Tool is web-based interface that enables administrators to configure and manage the following basic IP phone settings for group members:

- ✓ Basic system parameters
- ✓ The system phone directory
- ✓ Extension and group parameters
- ✓ Voice mailboxes
- ✓ Group membership (add, edit, or delete users from the system directory)
- ✓ Users' personal keys

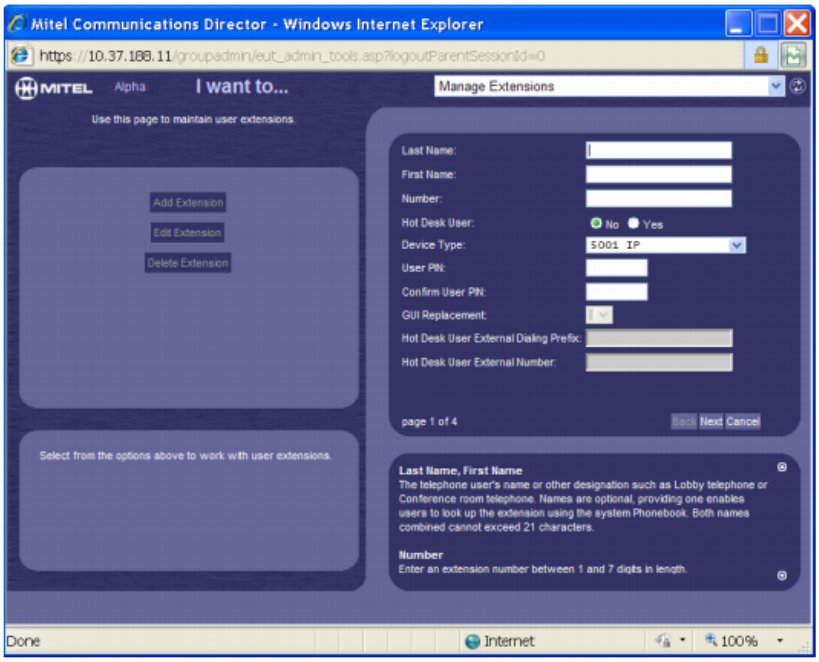


Figure 10: Group Administration Tool Interface

System Administration Tool

The System Administration Tool enables trained technicians and system administrators to program system-wide settings, voice settings (lines, extensions, management parameters, system directories, and voice mail) and IP network features. The System Administration Tool provides access to Maintenance Logs, Software Logs, and Login and Logout Audit Logs. The User and Service Configuration form provides administrators with the following capabilities:

- Consolidated view of user or device information: this simplifies the add, modify, and delete functions for users and devices and reduces the number of times the same data is entered into the system.
- Copy user functionality: administrators can quickly create new entries using existing user
- or device settings and configurations.
- Import capability: administrators can quickly collect and import user and service data using Microsoft Excel spreadsheets. These spreadsheets contain built in validation similar to ESM data entry rules which helps reduce errors.

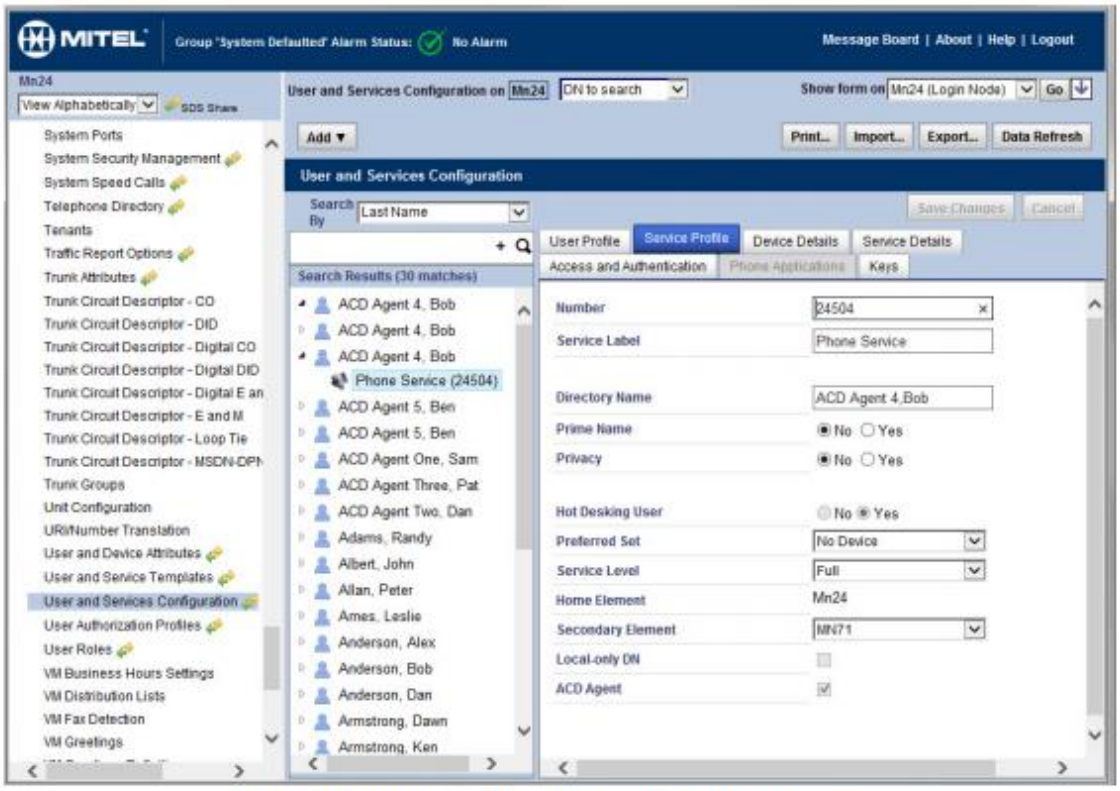


Figure 11: User and Service Configuration Form

Scheduler form

The Scheduler form is used to schedule system events to run automatically. For example, you can create an event that causes the system to switch to night service every evening, and another event that causes it to switch to day service every morning. To reduce management overhead and improve productivity you can schedule the following
events to run automatically: Backups, CSV File Import/Export, File Transfers, IDS Synchronization, and Night/Day Service. The Scheduler tool can also automatically log out Hotdesk Users at a set time. The Scheduler tool includes a calendar that can be updated with holidays. When you add an event, you can specify a repetition interval, such as daily or weekly, and indicate whether the event should run on holidays or only on weekdays.

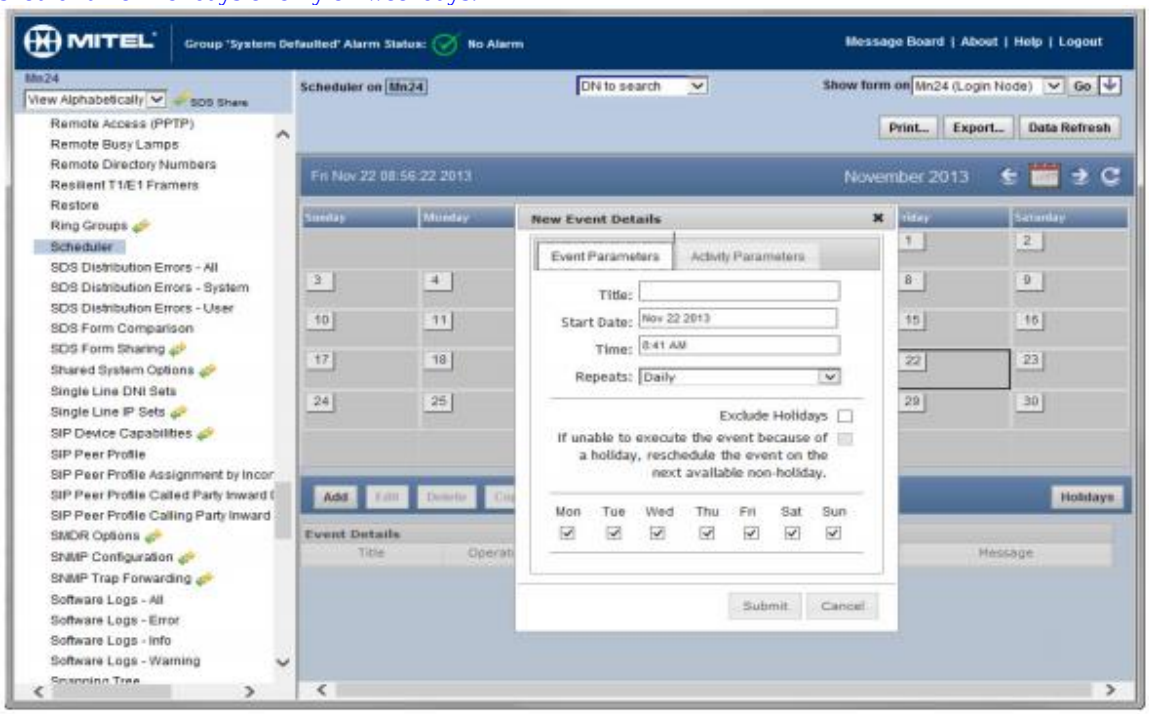


Figure 12: Scheduler Form

The System Administration Tool

- Includes Audit Logs that provide a historical record of changes made to the system from the System Administration Tool and various other user interfaces and applications. This assists with troubleshooting problems that arise, enabling you to determine who, in a multi-administrator system, is responsible for a particular change.
- Supports Range programming. Range programming speeds up MiVoice Business programming and configuration by enabling the administrator to program repetitive data using a single command. The administrator can also print forms and form data.
- Includes data import functionality that enables administrators to quickly import large numbers of new users and devices via a .CSV format file. Administrators can collect a substantial configuration data in the spreadsheet file and then import it directly into the MiVoice Business database. The import functionality eliminates the need to manually enter configuration data for each user or device and reduces the likelihood of data-entry errors. Technicians can import new user data when setting up a new system and administrators can import large numbers of users or devices whenever they need to be added.
- Administrators can "reach through" to the System Administration tool of any network element to program it, and backup all databases from a single session on a network element.

For additional details, refer to the MiVoice Business System Administration Tool Help has been included on the USB.

ALARMS MANAGEMENT

The 3300 ICP system raises an alarm when an anomaly is detected and corrective action is required. The system continuously provides attendants who are using Mitel consoles with alarm status information. You can program alarm threshold levels. There are three classes of alarms:

- ✓ Critical: indicates a loss of service that demands immediate attention.
- ✓ Major: indicates a fault that affects service to many users. This alarm usually results in a major degradation in service and requires attention to minimize customer complaints
- ✓ Minor: indicates any fault that does not fall into either of the above two classes. When the system is not 100% operational, a minor alarm is raised. It may require the attention of a technician, but it is not urgent. Examples of a minor alarm include the loss of a single line or trunk circuit

The system clears an alarm condition when the fault is corrected.

REMOTE ALARMS NOTIFICATION

Administrators can set up remote alarms to notify technicians of critical, major, or minor alarms. MiVoice Business e-mails the notifications to up to 10 addresses. Prompt notification helps ensure issues are addressed quickly. MiVoice Business supports Simple Network Management Protocol (SNMP).

CONTROLLED SYSTEM ACCESS

System Administrator Policies enable you to control access to System Administration Tool forms for individual users. When you create a policy, you set permissions that grant Read or Read/Write access to forms. Denying access to a form hides it from view. You can enable remote access to forms and distribute policies to all platforms in a MiVoice Business cluster using System Data Synchronization. Mitel offers Management Access Point (MAP) to provide secure, controlled access to systems and system tools from remote locations.

IP PHONE ANALYZER

IP Phone Analyzer is a Windows application that collects performance information from IP Phones on a network. Technicians can use one PC to monitor the status of all IP phones on the system. IP Phones within the network send debug, status, and statistical information to IP Phone Analyzer. Technicians can direct phones to new IP Phone Analyzer addresses via a MiVoice Business Maintenance task. This eliminates the requirement to reset the phones manually. IP Phone Analyzer provides information in four views:

1. Status View: displays the status of each phone registered with IP Phone Analyzer, MAC Address, IP Address, Directory Number, State, Link Lost, Set Type, Absolute Time, Load Revisions, Current ICP, and the CODEC type being used by each set on the network.
2. Packet View: displays trace messages sent from each set for analysis.
3. Packet History View: sorts messages received by IP Phone Analyzer.
4. Call Statistics View: displays call statistics, including RTP statistics, collected from IP sets.

SYSTEM DATA SYNCHRONIZATION

System Data Synchronization is an enabling technology that:

- ✓ Reduces the time to provision and administer multiple MiVoice Business nodes by automatically updating common data changes around all of the relevant nodes without any administrator intervention.
- ✓ Ensures that changes to network data are performed consistently and accurately across the network, improving change management costs.

- ✓ Simplifies network deployment and reduces initial deployment costs by synchronizing the newly deployed MiVoice Business nodes with the existing network.
- ✓ Enhances security management across the network by allowing accounts and passwords to be managed centrally.

The System Data Synchronization application enables administrators to synchronize database information among a network or cluster of MiVoice Business systems. Database changes made to a platform in the network or cluster are applied to the other platforms.

2. Is self-service supported? Yes, the user desktop tool allows for customer end-users to program their own devices.
   a. If so, please include screenshots of the self-service portal

User Desktop Tool Interface

   b. If so, please describe/provide an exhaustive listing of what can be performed through the self-service portal. User Desktop Tool provides a simple task-oriented user interface. Users can configure IP devices on their own with communications options such as feature keys, personal directories, call forwarding and Internet bookmarks.
3. If not described above, how are moves, adds, and changes performed?
4. How are system-wide phone services added, removed? Generally, system wide phone services are going to be role based. The system allows configuration based on Class of Service and Class of Restriction (what features are allowed to a specific role and what calling restrictions – if any are in place) We can implement numerous CoS and CoR templates based on our experience, best practices and feedback from the County.

Additional RFP requirements:

In addition to the above, proposals should be sure to factor in:

- Assistance in gathering needed end-user information to be used in programming the new system. TIG has accounted for scheduled departmental/building meetings, but ultimately will require a single point of contact from the County for anything requiring final approval. We have not accounted for meeting with every single user. Further discussion is required if the County wishes for TIG to provide granular services down to specific users.
- Conducting system "failover" testing. This is part of our standard implementation practices and included.
- Providing any needed on-site "post-cutover" support. This is part of our standard implementation practices and included.

Phone System Implementation Process:
TIG Implementation & Support Methodology

The fact is, there are a lot of options to consider which either leverage the existing solution or further enhance its capabilities – introducing new UC applications. The planning and Implementation Stages are not going to follow an exact process for every customer, but our team will dedicate all of the appropriate resources to ensure a smooth transition. During our Project Management meetings, we will ensure we tailor the appropriate roll-out of any new features and/or upgrades.

Planning and Implementation Stages for The County of Champaign

- **TIG Project Kickoff meeting with The County of Champaign**
  - Introduce key personnel
  - Discuss overall scope of work
  - Review any third party involvements such as SIP/PRI carrier and other equipment manufacturers
  - Set project timelines, milestones, and deadlines.
  - TIG uses Microsoft Project and will create a Gantt chart with specific information and tasks assigned.
  - Set expectations
  - Discuss general overall requirements needed to support the project such as cabling, networking, carrier services
  - Overview of end user training requirements
  - Discuss customer deliverables
  - Set follow up meetings to review details of networking requirements, database collection, 3rd party integrations, project status meetings
  - Discuss any The County of Champaign special procedures for a successful implementation (e.g., background check for on-site technicians during implementation, logistics for delivery, secure facilities for staging, etc.)

- Planned decision regarding SIP trunk service provider – this may be a priority if anything changes and Call One is not used.

- **TIG Database planning meetings & site surveys**
  - Spreadsheets- used to identify users, their phone types, and assigned applications such as voicemail, unified messaging, twinning, MiCollab, AWV and restrictions
  - Key templates- customization of lines, speed calls and features on user phones
  - Hunt Groups, ACD Path planning- detailing call flows, options
  - Voicemail Auto Attendant planning- scripting and call handling for main numbers that are terminated to an automated application
  - Key shareholders need to be identified for database discussions. If these will take place with any individuals who are not always accessible, we must ensure these meetings are prioritized to mitigate delays.
  - We will rely on The County of Champaign to assist with facilitating these meetings.
  - This is the most critical phase of the project; we will require The County of Champaign's assistance with coordinating these meetings and ensuring that they are contiguous
  - TIG will make The County of Champaign aware of any risk factors discovered during our site-surveys
  - TIG will establish with The County of Champaign primary point of contact what features should and should not be offered as we meet with the rest of The County of Champaign.
  - The expectation is that The County of Champaign will accompany TIG during site surveys with access to all areas.

- **TIG Networking Requirements meeting**
  - Review the Mitel LAN/WAN Guidelines detailing required network infrastructure necessary to support VoIP such as cabling, switching, QoS and network bandwidth
  - Review requirements for any VM environment servers
  - Identify network addressing and VLAN IDs to be used by the new VoIP systems
  - Identify Domain naming, DNS, time, and mail servers, DHCP options
  - Discuss requirements for internet facing applications such as Teleworker, MiCollab external access, softphones, Mobile users, AWV portal, etc.
  - Configure and install any Data Network hardware per the requirements if we are selected for this portion of the project. This would be led by our Professional Services Manager.

- **Review of completed Database**

- **Deployment, licensing, and configuration of Primary MiVoice Business Mitel 3300s or Virtual applications (as applicable)**

- Servers are “stood up” and database import forms and recordings are loaded, and applications are configured
- Since our primary applications are configured for centralized registration on the Core MiVoice Business and Core MiCollab applications, once these are built and tested programming can begin.

- **In-house build, licensing, configuration and testing of physical controllers and servers**
- **Onsite deployment of Mitel purpose built hardware**
  - Network all Mitel 3300s into the County of Champaign cluster
- **Phone set and application programming**
  - Program phones according to the agreed upon user templates and key sheets.
  - Program IP Phone resiliency for local fail-over
- **Phones are delivered, assembled, placed, and registered**
  - With The County of Champaign’s transition from digital phone systems to an IP based system, the IP phones can be placed out ahead of time, tested, etc. as they will be over The County of Champaign’s data network.
- **SIP Service Provider turn up and testing**
  - SIP Session Border Controllers tested
  - Inbound and outbound calling are tested with the carrier
  - Test hunt/load-balancing, fail-over of numbers
- **Quality check**
  - Main number call flows, greetings, Auto Attendant responses are tested to ensure desired operation
- **End User training**
  - Users are trained on working, customer system phones, voicemail, and applications to ensure understanding of all major features and tasks. This will be conducted per the RFP requirements.
  - TIG’s Project Manager will coordinate all training related to the new system cutover. Training is typically “Classroom Style” using live phones; however, we are flexible to accommodate following appropriate health guidelines at the time of training. ***Most of our recent deployments have been done using web/video collaboration tools in combination with in-person training.***
  - Details & frequency of each training session:
    - Telephone Users - Individuals will be trained on the features they use and how those features interact with company procedures.

        - Class time – 45 minutes
        - Minimum of 20 users per class
    - Voice Mail Users – Voice mail users will be trained on all aspects of using their mailboxes.
        - Class time – 30 minutes
        - Minimum of 20 users per class
    - Conference, Collaboration & Mobility Users –will be trained on all aspects of implemented applications purchased by The County of Champaign.
        - Class time – 30 minutes
        - Minimum of 20 users per class
    - Customized cheat sheets are distributed and will be specific to The County of Champaign's new system and end-user applications deployed along with online user training.
    - For auditorium style training, The County of Champaign is welcomed to video the classes and distribute the "best" one for additional follow up training.
- **Cutover – Target Date – TBD with The County of Champaign.**
    - TIG personnel on-site at time of porting and cutover
    - All call flows, main greetings, Auto Attendant applications are tested again to ensure desired operation on the live system
    - Since all phones have already been tested, the cutover will consist of moving the existing PRI handoff from Call One to the new Mitel 3300 system.
- **Follow Up**
    - TIG personnel are on onsite to ensure user understanding and to provide remediation of any issues that may arise
    - For large deployments such as The County of Champaign, TIG will setup a help-desk on site with an extension number to field questions.
    - Removal of existing systems
    - Schedule TIG Administrator training. We typically do this a week or two after cutover, so that any small changes can be done live during training on The County of Champaign's own system.
        - Typically, a half-day session, but dependent on Applications deployed and number of Administrators.
- **Project closeout**
    - Plans for remediation of any outstanding issues are completed

- As built diagrams and system documentation are turned over
- Ongoing customer management is introduced and transitioned to the TIG Support Department (Technical Assistance Center)

- **TIG Maintenance Support** ***(Included Year 1 with pricing for Years 2 through 5)***
  - All Parts
  - All Labor
  - 24 X 7 X 365 remote and on-site support for a major outage
  - Installation of required patches for proper operation of telephone and voice Mail systems
  - Ongoing consultation to assure both system and users optimum working conditions
  - Technology refresh meetings
- **TIG's Technical Assistance Center**
  - TIG works diligently to provide exceptional customer service and support to our clients. Our team responds efficiently and effectively to your requests.
  - Clients can submit service requests by phone, fax or email to the Technical Assistance Center (TAC). Once a ticket has been submitted, one of our certified technicians stays in constant communication with the customer to let them know the status of their request right up until the ticket has been closed. Please note that all service requests should be requested through TAC.
  - With respect to a major malfunction of the Equipment defined in the following parameters: no incoming or outgoing telephone service, or no station to station service within the telephone system, or attendant console is unable to answer and/or transfer calls, or fifty percent or more of the C.O. trunks and/or stations are in an inoperable state, Telcom Innovations Group' policy is to arrive at the Customer's premises within four (4) hours from the time Telcom Innovations Group first receives the Customer's request for remedial maintenance and will complete such repairs as soon as reasonably practicable.
  - Technical Assistance Center (TAC)
  - TAC Main: (630) 616-4200 | TAC Fax: (630) 616-4300 | Email: service@ask-tig.com
  - Service hours
  - Normal service and requests: TIG's Technical Assistance Center is staffed from 8:00 AM to 5:00 PM C.S.T., Monday through Friday. Please submit your request by calling the service number or sending an email to service.
  - After-hours emergency service: On-call service technicians are available 24 Hours a day, seven days a week including holidays.
  - To request emergency support, call the main service number at (630) 616-4200 and follow the voice prompts to page an on-call Technician.

- Do not send an email for emergency service requests.
- Expectations for service calls: Emergency Service requests during business hours: A live service agent will take your call. Non-emergency service requests are generally handled within 24 hours.
- After-hours emergency calls: You will be answered by a scripted auto-attendant intended to gather your site information. The on-call technician will be notified, and you should receive a call back within 30-60 minutes.
- E-mails to service: The TIG Service Center is equipped with the Mitel Contact Center solution which will generate an automatic email response. Normal email service requests are handled within 24 hours. If you have an emergency request, please call TAC directly.

Proposed Innovations:
TIG Solution Summary for The County of Champaign

Design Overview: MiVoice Business Software (MiVB)

- At the heart of our solution for The County of Champaign is Mitel's flagship software called MiVoice Business. This will serve as the call control software and is a single-stream of software that allows for deployment across multiple platforms. Management is performed under a single interface to make provisioning and changes easy for IT Administration.
    - Options include a few variants of the Mitel 3300 purpose built hardware. The software can just as easily be deployed using Industry Standard Servers, Hyper-V, VMware, or various Cloud models. We highly encourage The County of Champaign to evaluate leveraging its existing investment in VMware/Hyper-V as part of our solution. This allows for a significant cost reduction (initial and ongoing) and our applications leverage vCenter/vSphere resiliency tools such as High Availability, vMotion and Site Recovery Manager.
    - The software deployment platforms can be a mixed environment and there is investment protection if the County of Champaign IT strategies shift over time. E.G. deploy with purpose built hardware today, and migrate to a virtual environment in the future or vice versa. Multiple nodes will be clustered together so that changes propagate across all systems and the System is treated as one.
    - Continuous improvements have been made that streamline and enhance the management capabilities of the System.
    - The system is managed as a single phone system from a web GUI interface that allows various levels of administration and is permissions based. This is further complimented by Mitel Performance Analytics management tool.
    - All of the Mitel 3300 gateways will be networked and clustered. This allows for simple management, so that they are all aware of one another and changes made will propagate across the cluster automatically.
    - Native IP Phone resiliency is accomplished through a distributed architecture and will continue whether the controllers are replaced or not. IP Phone Resiliency occurs automatically and seamlessly transfers support for an IP phone to a resilient system if the phone cannot communicate with its primary controller.

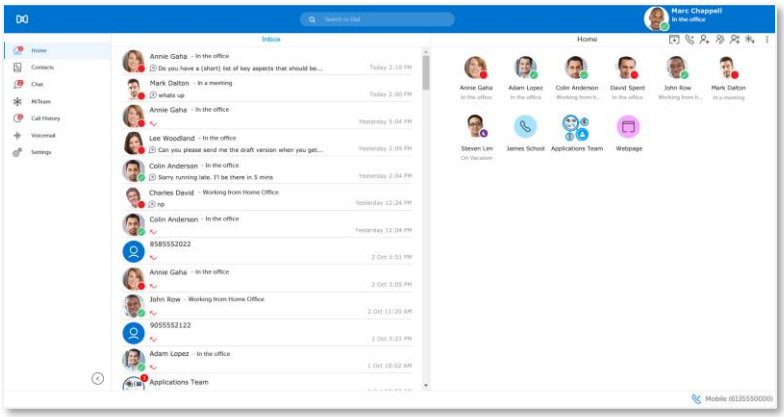
- In most modern designs, we are seeing the majority of deployments where customers prefer a centralized registration and secondary resilient location failover. We also see some County Governments that want to have all Mitel phones register to a single virtual MiVoice Business running on VMware which can support up to 5000 users and local fail-over at every remote location.

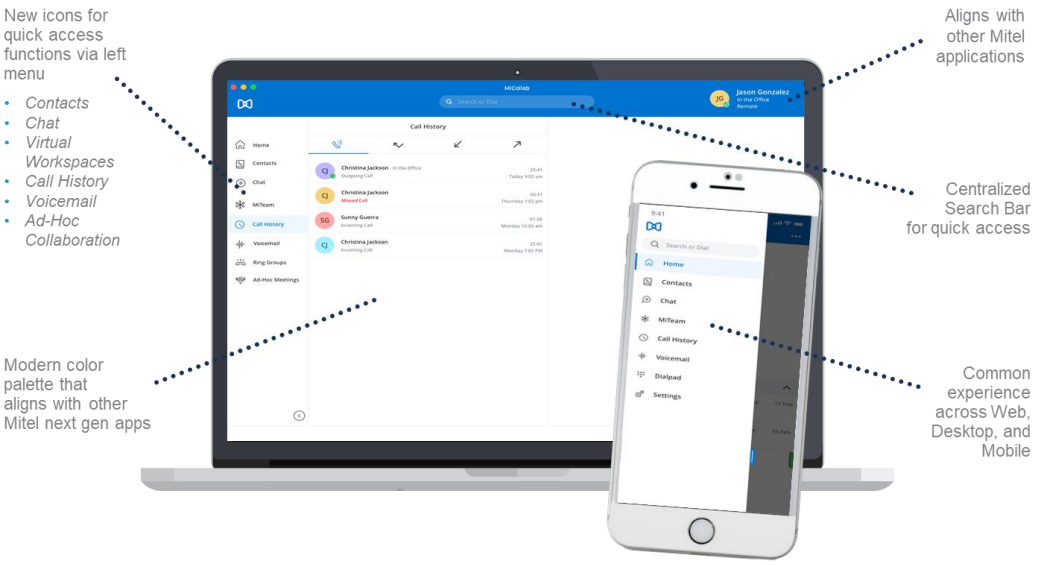
- Further discussion will facilitate considerations based on the current County Government environment and determine how critical site survivability while making the best use of the customer WAN and Virtual infrastructure.

Design Overview: MiCollab Multi-Application UC Server

MiCollab Server is functionally a multiple applications server for all of the Unified Communications that The County of Champaign receives with Mitel's UCC user license structure Option and can support the following applications:

- **MiCollab Client** ***(Included for all The County of Champaign users)*** will provide a Unified Communications presence client to show real time status of other users. Quickly reach the right contacts the first time. Integrated with MS Active Directory, Outlook/Google Calendar and providing a seamless experience across all devices. End user client is available for PC, Mac, Web and Mobile and includes softphones and appropriate Teleworker licenses.

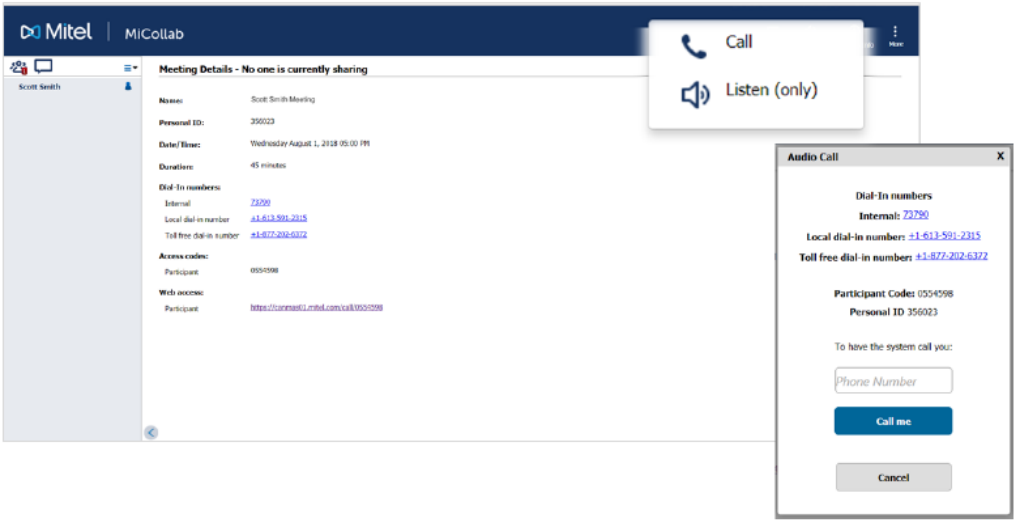




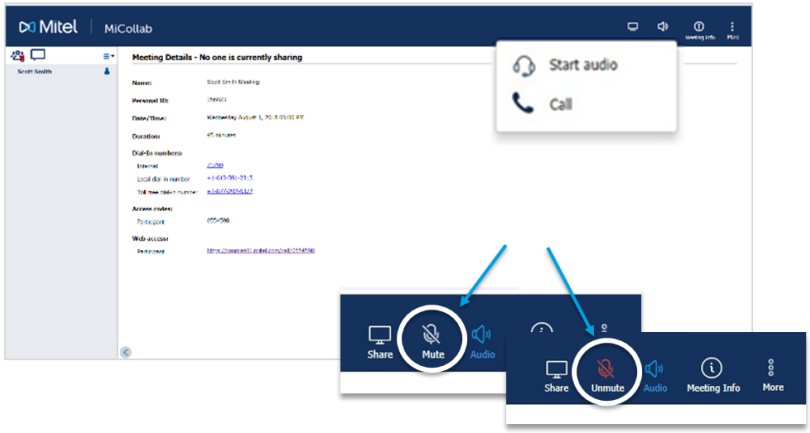
- **MiCollab Client Softphone feature** ***(Included for all The County of Champaign users)***
    - ***Choose your preferred device with PC, MAC, WEB or Mobile Android/iOS devices.***
    - MiCollab softphones enable users to perform the following actions:
        - be accessible for calls by their MiVoice call management system
        - dial other users on the network regardless of the type of device
        - establish a point-to-point audio and video call with SIP Softphone
        - access all functions through a mobile client device (Android and iOS):
            - dial over Wi-Fi and 3G/4G/LTE/5G networks
            - communicate using mobile-optimized H.264 video performance
    - MiCollab softphone connects directly to the PBX or through the MiVoice Border Gateway (Teleworker Server), providing secure remote working capabilities without the need for a dedicated VPN service.

- **Audio/Web/Video Conferencing will provide real-time collaboration with HD video codecs included.**
    - ***73 Ports of Audio/Web/Video port conference bridge have been included and is available for all 635 County users.***
    - This supports both internal and external conferencing needs.
    - The MiCollab Audio, Web, and Video (AWV) Web client's join experience is simple; allowing users to manage their participation via a single web page.
    - MiCollab users enjoy ease of use features including:
        - Single web tab to join the conference
        - Simplified callback to join audio from within the conference
        - Embedded call to tagging to allow dial-in to the conference via the MiCollab client
        - Removal of "the mirror effect" when sharing using the AWV Web client
        - Improved reconnection for users after a loss in network connectivity

MiCollab: Easy Dial In



Full Web Collaboration Experience



- Full Web collaboration experience
  - *With Chrome and Firefox browsers*
- Choice to:
  - *Dial-in*
  - *Have system call you OR*
  - *Two-way audio from the Web*
- User can mute/unmute their Web connection

- In addition, system-generated MiCollab AWV meeting invitations (from the MiCollab Outlook plugin, Ad-Hoc Meeting tab, or AWV Web portal) include a section for participants who are calling in via their mobile device. This “tap to join” option enables mobile users to join a conference from the meeting invitation with PIN code information automatically included.

- **Teleworker** ***(2 licenses Included for all County users)*** allows for a remote IP user to connect a physical or softphone over any high speed internet connection and is provided for all UCC Standard users (it can also be purchased ala carte, but it is actually more cost effective to simply uplift to UCC Standard).

  - Teleworker can be used for any IP Phone or Softphone that is off network and securely connects remote user phones with the Mitel MiVoice Business System.
    - Secure RTP encryption & 128-bit AES voice
    - SSL-based security for protecting call control signaling

- Eavesdropping prevention
- Protection from monitoring or modification of call control signaling

- TW can also be incorporated as part of The County of Champaign emergency preparedness planning and business continuity, we have seen other organizations implement our Teleworker solution as part of their EOC (Emergency Operations Center) in event of an emergency.
  - These could even be in mobile cases along with wireless Hotspots if the County needs to go to a specific crisis management site.
  - Teleworker also serves as a potential Disaster Recovery solution for on-site workers that need to work remotely. We deployed thousands of users during the work-at-home stages of the Covid-19 pandemic, but this would also extend to power outages, water main breaks, and gas leaks.

Design Overview: IP Phone upgrades to the 6900W series family

- **As part of our base proposal:**
  - ***Including 635 of the Mitel 6920W IP Phones – highlighted Feature includes Bluetooth and 802.11 a/b/g/n dual band Wi-Fi chipset to facilitate quality of life for work-at-home and remote users.***
  - ***A variety of other 6900W Series phones & accessories including best-in-class headsets have been provided with our detailed equipment itemization showing line item discounts.***

6920w, 6930w and 6940w IP Phones

There's no denying the way we worked pre-Covid has changed business and significantly impacted how we connect and collaborate today, post-Covid. Businesses are faced with a shift between the balance of working from home and in-office spaces in a typical work week. Face-to-face meetings have been replaced by PC-based video collaboration in a preferred and efficient home office setup, while in-office spaces are being consolidated into more shared workspaces. With this shift, workers choosing between home and office are having to manage multiple modes of communication and collaboration in their daily work routine which is posing some challenges.

Mitel 6900w series IP Phones – 6920w, 6930w, and 6940w were designed to uniquely address these challenges making them an ideal collaboration companion for the home and in-office work environments. They provide all the same features and benefits as their existing equivalents – 6920, 6930, and 6940 IP Phones – the same display sizes, the number of buttons and the well-known telephony features. What sets these three models apart is Mitel's first-of-their-kind PCLink feature. PCLink allows you to connect your phone to your PC via Bluetooth turning your phone into a high-quality audio device for PC-based video collaboration. PCLink enables you to seamlessly pivot between PC collaboration and phone calls on a single device. The IP Phones offer maximum deployment flexibility with built-in Wi-Fi and wired Ethernet network connectivity options for home and in-office environments.

The 6900w series supports existing accessories that are available today to the existing 6900 IP Phones such as:

- DECT Integrated Headset (NA, Int'l)*
- H10 Stereo USB Headset
- H20 Mono Analog Headset with QD Cable**
- H30 Stereo CC USB Headset with QD Cable
- H40 DECT Stereo Headset (NA, UK/International, EMEA)
- 6900 Bluetooth Handset***
- S720 BT Speakerphone
- M695 PKM (color)

*The 6920w does not support the Integrated DECT headset
** The 6940w only has a USB headset port
*** The 6920w does not support the cordless handset, whereas the 6940w ships with it as a standard

Mitel 6920w IP Phone (635 Included with Base Proposal)

Mitel's 6920w IP Phone is designed for users who want a modern design, as well as a phone that is flexible and delivers a high-quality communications experience. The 6920w provides flexible network connectivity options including wired ethernet and built-in Wi-Fi, which allows for easy installation in work-at-home and corporate environments.

The 6920w features PCLink which turns the phone into a high-quality audio device for PC-based video collaboration. PCLink enables seamless handling of both phone calls and PC audio through a single easy-to-use device. With PCLink, users do not have to use two separate audio accessories, one for phone and one for PC . All communications are managed by the 6920w and allows users to work hands-free using the speakerphone or optional attached Mitel H-Series headset.

In addition, the 6920w IP Phone features MobileLink, which provides seamless mobile device integration by marrying mobile phone call audio with both contact and call log information with the desktop phone. Calls to the mobile phone can be answered on the 6920w just like any other call leveraging the superior audio performance and ergonomics. Mobile phone contacts and call history automatically synced with the 6920w allowing access to the same information on either device. A powered USB port suitable for charging a mobile phone is also built into the 6920w.

The 6920w provides Bluetooth and USB headset support. It features an analog headset port that provides dual support for DHSG and modular 4-pin headset connections.

Feature Keys

- 6 programmable keys with paging that enables up to 18 Lines, Speed Dials and Telephony functions*
- 4 context sensitive keys with paging support*
- 4-way navigation key
- 11 dedicated feature keys plus dial pad

Audio and Codecs

- Mitel Hi-Q Audio Technology
- Hearing aid compatible (HAC) handset
- Full-duplex high-quality speakerphone
- Codecs (supported codecs differ based on call manager platform):
  - G.711, G.729, G.722 G.722.1 (MiNet Only)
  - G.726, iLBC AMR, G.722.2 AMR-WB (SIP Only)

Display and Indicators

- 3.5” QVGA (320x420 pixel) color display
- Intuitive graphical user interface and navigation menus
- Adjustable screen brightness
- Programmable key status indicators
- Dedicated LED for call and message waiting indication

Protocol Support

- SIP protocol support
- Mitel and 3rd Party call control
- Mitel IP (MiNet) protocol support

Connectivity

- Wi-Fi – dual band (2.4GHz / 5GHz) 802.11 a/b/g/n
- Dual Gigabit Ethernet ports - LAN + PC
- Bluetooth (BT) version 5.2
- Powered USB 2.0 Host port (500mA)
- Sidecar expansion port
- Dedicated 4-pin modular headset port convertible to DHSG capable headset port

Integration

- PCLink – use phone for PC audio via BT
- MobileLink
- Mobile pairing via BT
- Mobile Call Audio via desk phone
- Mobile Contact Sync
- Mobile Call Log Sync
- Mobile Charging (USB port)
- Support for Mitel Teleworker Solution, Automatic Call Distribution (ACD) agent and supervisor, hot desking, and resiliency
- Secure encrypted voice communication
- Quality of Service support – IEEE 802.1 p/Q VLAN and priority tagging
- IEEE 802.1x authentication support

Powering

- Designed for power conservation
- Accepts IEEE 802.3az Energy Efficient Power over Ethernet (POE)
- POE Class 3 with automatic POE class change on Expansion Module Installation
- Supports local power via 48V wall adapter

Design Overview: User Licenses

- ***635 UCC Standard Licenses are included in our base proposal.***
  - Phone License (multi-device user license) which allows an IP phone to operate, it also allows for a personal ring group that is most commonly used as a Single Number Reach “twinning” paired with a mobile device or softphone. We can add up to 8 devices in a personal ring group.

- MiCollab Client – PC, MAC, Web and native Mobile Client (iOS/Android) with Softphone available for any device.
    - Self-Deployment with QR code
- 2 Teleworker Licenses (1 for off-network softphone, 1 for off-network deskphone)
- The Audio/Web/Video entitlements come from these licenses. The County receives (10) ports with the 1st license, and (1) additional port for every (10) users thereafter for a total of 73 AWV ports.

- ***As proposed, all users will receive UCC Standard licenses. There may be an opportunity for the County to reduce costs by downgrading some of the licenses to UCC Entry or UCC Basic Enterprise user licenses. For example, common area phones are unlikely to require softphones or voicemail and can be deployed successfully with a lower tier license.***

Design Overview: E911 with Mitel Revolution (Included in Base proposal)

- ***Enhancing the County's Life Safety & E911 planning. This further ensures compliance with Kari's Law and Ray Baum's act requirements.***
- Mitel Revolution Mass Notification base package (powered by Syn-Apps) has been proposed for The County of Champaign as part of our base solution. Sizing should be discussed further.
- The users or devices that should be notified and the mediums that the notification occurs, will play a role in how this subscription is priced. For purposes of the RFP response, we have included the base package – which should be a great start if we are only looking at E911 alerts. The capabilities do far extend beyond 911 call notification though.
    - **The Mitel Revolution base proposal software includes:**
        - **50 endpoint licenses**
        - **50 desktop licenses**
        - **50 mobile licenses**

Mitel Revolution Solution Overview

Mitel Revolution facilitates enterprise-wide communication for virtually any communications need, including real-time and automated notification alerts for emergencies, large scale notification for routine (or non-critical) communications, facility-wide live overhead paging announcements, scheduling of bells/prerecorded announcements and mobile-centric communications for mobile employees, students, or others who registered using its self-service portal.

This includes support for a feature-rich mobile application for receiving and sending notifications, geolocation and geofencing capabilities, an end-user (self-service) contact management portal for opt-in of communications via SMS text, e-mail, and voice, as well as out-of-the-box integrations with multiple notification services, such as

government-issued emergency alerts (CAP alerts) and Integrated Public Alert Warning System (IPAWS) for natural disasters, chemical spills, missing persons (AMBER alerts) and more.

Key Benefits

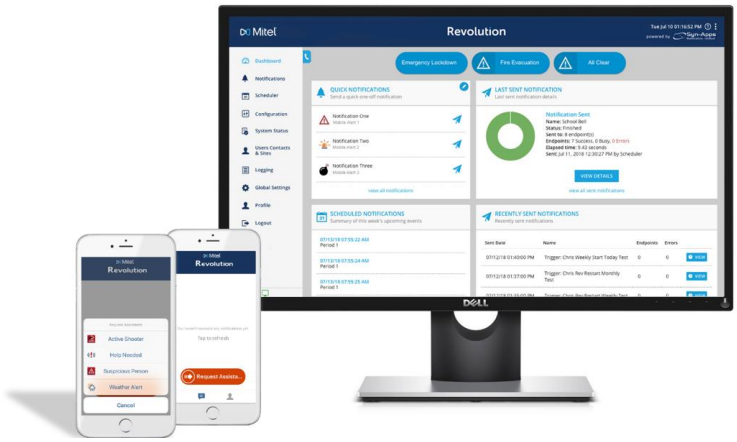
- **Complete Notification Solution.** Offers access to the broadest range of multi-modal communications enabling emergency alerts, mass notifications and routine communications all from a single platform.
- **Embraces Mobility.** Offers mobile apps for iOS and Android to enable notifications and alerts to and from mobile devices.
- **Simple Set-up.** With out-of-the-box integrations, it can be deployed and working in less than a day.
- **Designed to be Adaptable.** Expanded possibilities with a wide range of integrations with different hardware devices and software-based services to address today's and tomorrow's needs.

Mitel Revolution is Adaptable by Design

- **Large-Scale Support.** Easily scales to support thousands of devices enabling communications with large groups.
- **Self-registration.** Greatly reduces administrative burdens with the ability to automatically send an email to a contact and have them self-register for mobile or email notifications.

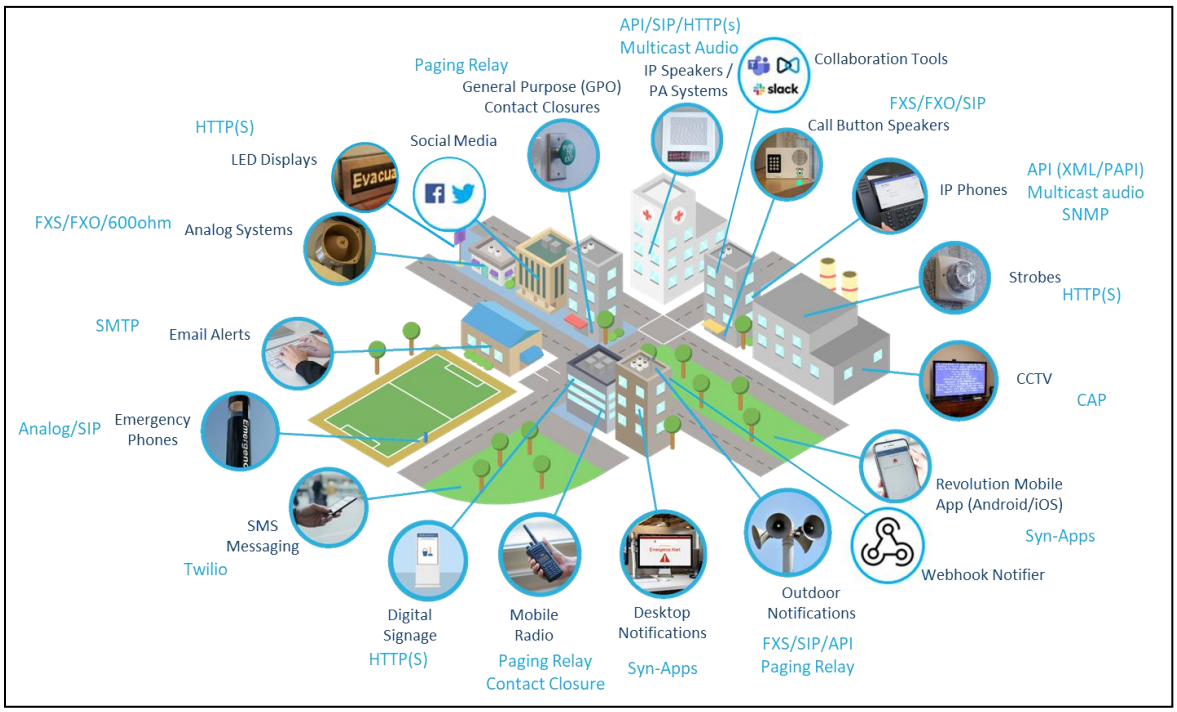
Key Features

- Multimodal communications to a wide range of devices
- Ability to address large-scale notifications - beyond 22,000 endpoints
- Mobile app (iOS and Android) for media-rich notification push, with support for two-way notifications
- Integration with third-party SMS services for large-scale text notification
- Geofence-based alerts
- Self-service contact portals
- Multicast paging to phones
- Out-of-the-box integration with automatic alerts from Emergency Notification Services
- Virtualized deployments
- Multi-schedule set-up
- Cradle-to-grave analytics for insight into system health & performance

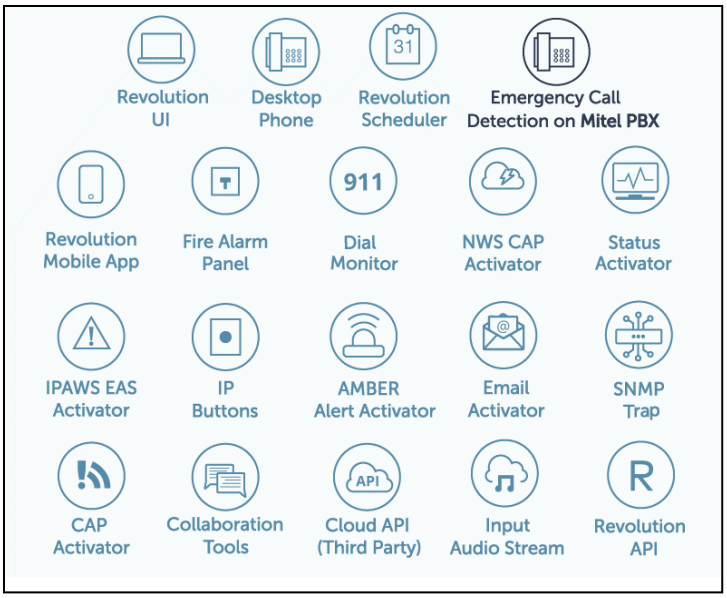


Mitel Revolution is Designed for Today's Modern Organizations

Mitel Revolution's wide variety of activation methods and notification device types, adaptable by design:



Mitel Revolution Notification Device Types



Mitel Revolution Activation Methods

Dependability You Can Count On

- Automatic hot-standby redundancy option
- Multi-location server support
- Fault-tolerant architecture
- Real-time reports to alert to what was sent and acknowledged
- Leverages patented unicast to multicast technology for simplified network deployment
- Support for virtualized environments

Mass Notification

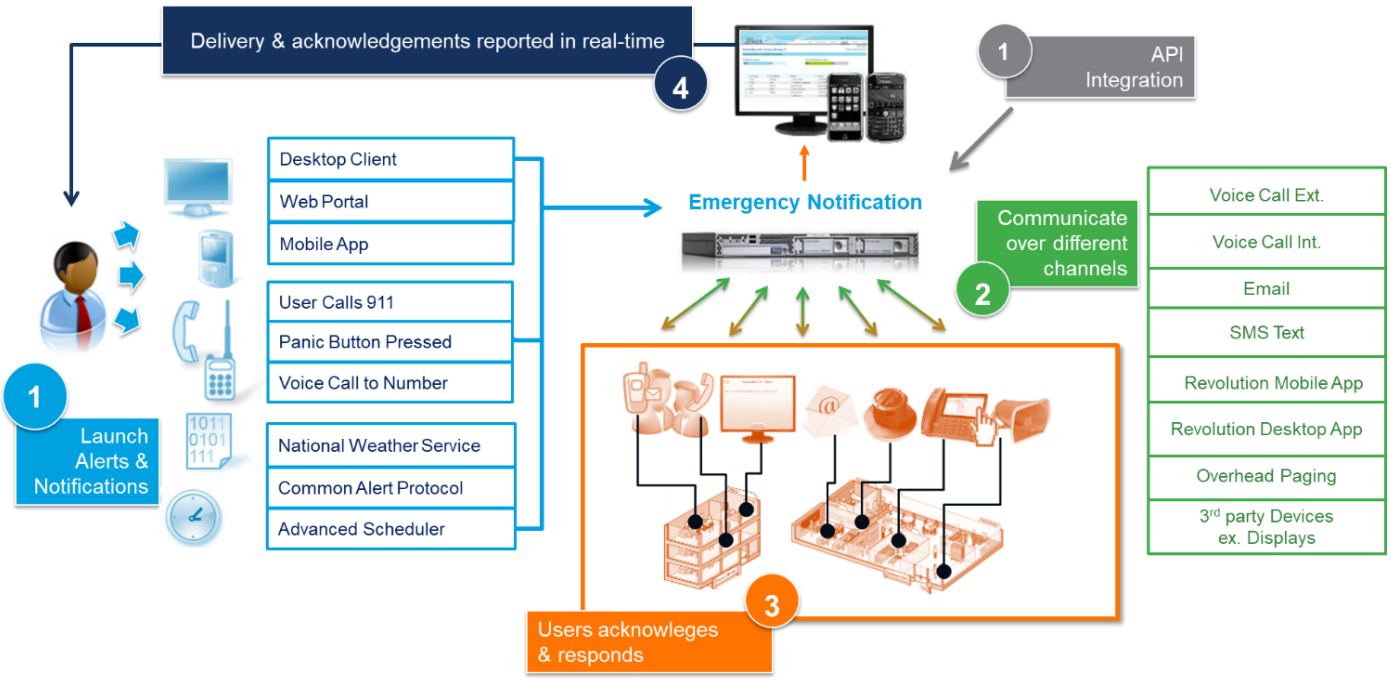
- Alerts using live, pre-recorded or scheduled broadcasts
- Multimodal communications to IP phones, mobile devices, overhead speakers, loud horns, digital signs and more
- Geo-location controls ensure recipients receive relevant information based on their current location

Emergency Alerts

- Communicate time-sensitive information during an emergency
- Support for integrated panic buttons, automatically alerts from external early-warning systems
- Trigger / receive events in the field using the Mobile app
- Alert others in or nearby the facility

Routine Communications

- Communicate important reminders, facility closures, new services and more
- Share information in real-time, on-the-fly or via scheduled notifications
- Easily notify large or segmented groups via e-mail, SMS texts and display boards



Mitel Revolution Supported Notification Triggers

IP Devices	Activate notifications from third-party IP devices, such as Speakers, Clocks, Strobes, Digital Signs, Emergency Call Towers, Paging Relays, Contact Closures (GPIOs), Access Control Systems, Smart Button (Panic Button) and more. Trigger notifications by dialing a line number internally or externally via DID.
SIP Devices	Trigger notifications from any SIP-enabled phone on the network.
Common Alert Protocol (CAP) Alerts	Automatic notifications triggers from National Weather Service (NWS), Integrated Public Alert and Warning System (IPAWS EAS), AMBER Alert, or any other CAP-enabled feed.
Mitel Revolution Mobile Client	Administrators can activate alerts directly from their iOS or Android Revolution Mobile Client app.
Mitel Revolution Web Client	Activate alerts directly from Revolution's web interface portal.
Mitel Revolution Scheduler	Create notifications in advance with Revolution's Scheduler tool.

Mitel Revolution Supported Notification Endpoints

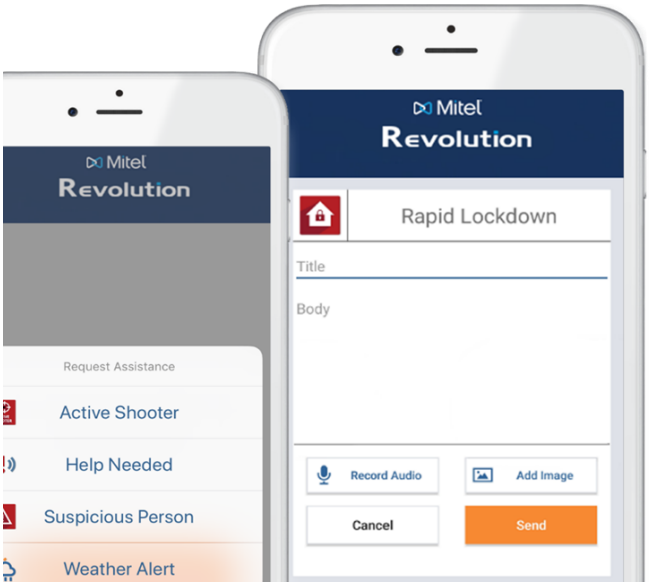
IP Devices	Notify via third-party IP devices like Speakers, Clocks, Strobes & Beacons, LED Displays & Digital Signs, Paging Relays, Mobile Radios, Internal or External Numbers, Access Control Systems, and more Compatible with most IP devices that support multicast
IP Phones	Audio/visual alerts including paging and text displays to supported Mitel IP phones and SIP phones
Mobile Devices *	Deliver multi-media push notifications to the Mitel Revolution mobile app Focus alerts based upon location and proximity to an incident zone using Geo-fencing capability
Desktop Devices	Alert with pop-up notifications delivered to PC and Mac desktop computers with a Desktop Override option to prevent their closing until the event has been terminated
SMS Services	Connect third-party Clickatell or Twilio SMS services to simultaneously send traditional SMS text alerts to recipients
Outbound Mass Dialing Services	Connect to third-party Twilio outbound mass dialing service for Text-to-Speech (TTS) or prerecorded audio
Email Services	Send alerts to email recipients using SMTP with authentication
Common Alert Protocol (CAP) Enabled Devices	Send to third-party digital signs, radios, and other CAP-enabled feeds
LED Signs	Send to third-party devices from IP Device Notifier and Advanced Network Devices
Other	Send notifications to non-XML-enabled devices configured to listen to a static stream like beacons and, IP phones. Send audio to third-party Analog-based paging systems

* iOS, Android, and Chromebook tablets are mobile devices using a mobile OS. A Windows tablet running the desktop client will use a desktop license, if part of a bundle, or an endpoint license if used separately.

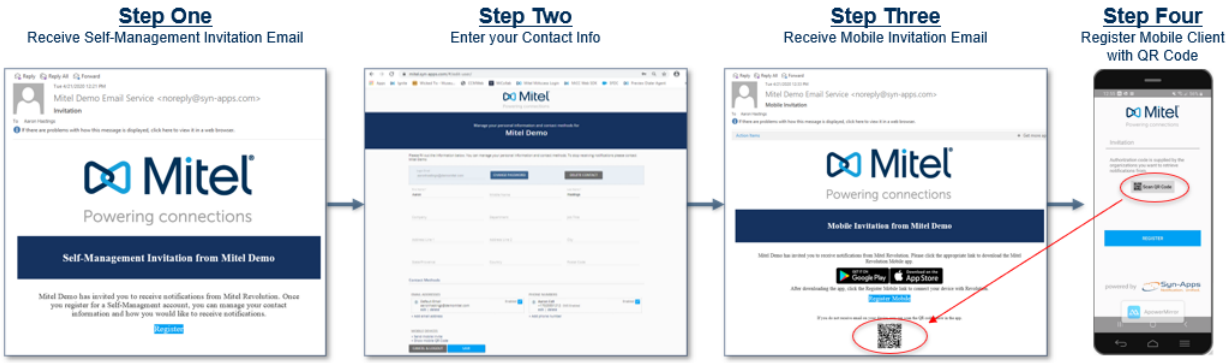
Mitel Revolution Mobile Client Application

The Mitel Revolution mobile client application supports iOS, Android, and Chrome OS on cellphones, tablets, and Chromebooks. The application delivers on key features, as follows:

- Mobile app for media-rich notification push
- Allows for two-way notifications
- Enables on- and off-premise alerting
- Create custom choices for the mobile assistance menu
- Enables sharing details with voice recording and images
- Geofencing support for controlling alerts based upon the current location
- Integration with third-party SMS services for large-scale text notification

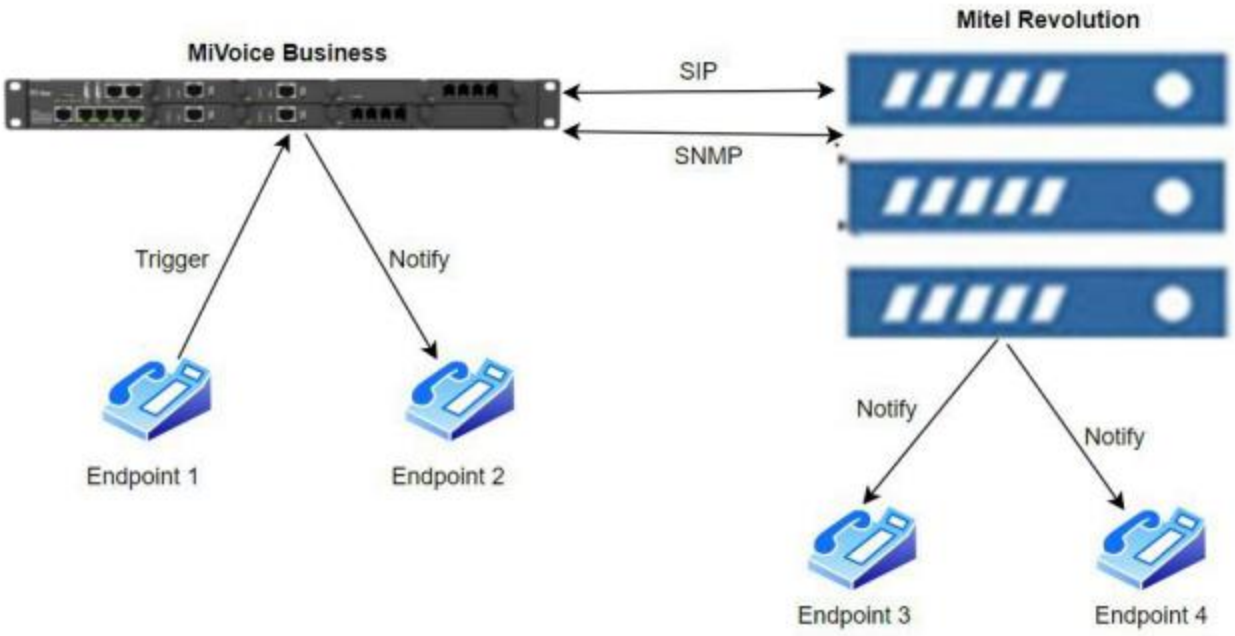


Each Mobile Client consumes a single mobile license. Easy self-registration begins with the mobile user receiving an automatic mobile invitation, to a website, which makes deployment on a mobile device in four simple steps:



Network Topology

The following diagram explains how the elements in the network are connected to the Mitel Revolution:



Design Overview: Mitel Call Accounting (Optional)

- ***This option has been priced for 650 Extensions and addresses Opt-S15***

  - **Mitel's Call Accounting** This software provides advanced reporting and analytics capabilities for non-contact center users. In short it gives scheduled or on-demand reporting capabilities that show cradle to grave – who called whom, when, and for how long. Reports are available as a PDF or .csv/excel.

    Used for
    - Departmental Reporting
    - Marketing Analysis
    - Business Intelligence / Business Management Dashboard
    - Traffic Analysis
    - Informal Customer Service Groups

- Call Costing

Report Filters allows your team to:

- use filters to tailor reports to your specific needs
- Filter using a variety of variables, depending on the report desired
- Filter by category - including call direction, call type, call duration, call cost, account code, phone number, DNIS, extension, and trunk
- Filter by time - day of week, month, day of month or 15-, 30-, or 60-minute intervals

Design Overview: Mitel Premium Software Assurance (Optional)

- ***Mitel Support through Premium Software Assurance (SWA) has been proposed as an Option.***
  - ***Mitel Premium Software Assurance offers 24x7x365 Technical Support services from Mitel***
  - ***Mitel Premium SWA gives Mitel Performance Analytics (MPA) at no additional cost.*** This powerful software tool will assist in proactively monitor and analyze the Mitel system performance, alerting of issues before they become issues. MPA has been uplifted to MPA Plus and includes further enhancements.
  - ***Mitel Premium SWA also gives access to many Mitel University System basic through advanced Mitel training courses.*** These are available online at no additional cost to any of The County of Champaign's users, but are geared towards technical support and administration resources, and Contact Center Management, Supervisors and Agents.

Design Overview: Mitel Performance Analytics

(This is part of Mitel Premium SWA Option)

- ***Mitel Performance Analytics comes as part of Mitel Premium Software Assurance.*** MPA Tools and Capabilities have been proposed with our solution in order to effectively monitor and troubleshoot any potential issues. This solution allows for real-time monitoring of The County of Champaign's solution all the way down to an individual IP phone.

Mitel Performance Analytics (MPA) provides tools and capabilities that simplify network performance management including:

- Secure remote access and testing tools for simplified troubleshooting and reduced truck roll – physical or virtual appliances
- 24/7/365 performance and availability monitoring to detect problems before users are impacted, depending on Service Level
- Real-time alerts and alarms to ensure problems are discussed quickly
- Reporting to demonstrate performance over time and assist with load balancing/forecasting
- Automated email to subscribers, monthly report of faults and resolution times
- Advanced management features to simplify the management of large, multi-node networks

The County of Champaign will be provided with credentials on the MPA secure management portal. The portal is web-based and accessible from any device over an encrypted connection.

MPA Features Network Diagrams

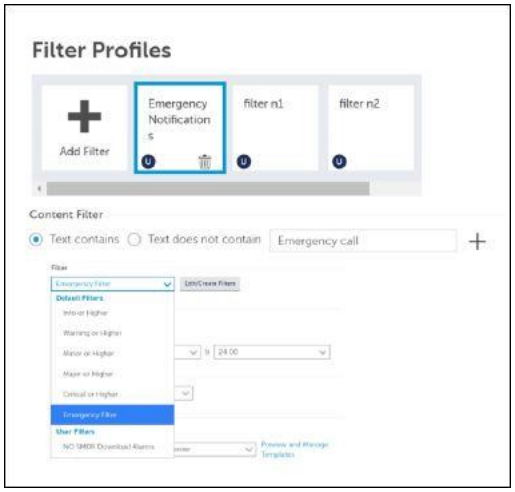
Mitel Performance Analytics (MPA) offers The County of Champaign the ability to upload a Visio diagram of a network topology. MPA provides some overlay health status icons for an at-a-glance overview of network components and their status.

From the Network Diagram panel, users can display the alarms of a particular container or device.

Mitel provides an overlay health status of network topology.

Mitel Allows Administrators to Customize Alarm Filters

With Mitel MPA, administrators can configure custom alarm filters. Users can see the right filters at the right time with filters that include severity, keyword, device type and label.



Mitel custom alarm filters

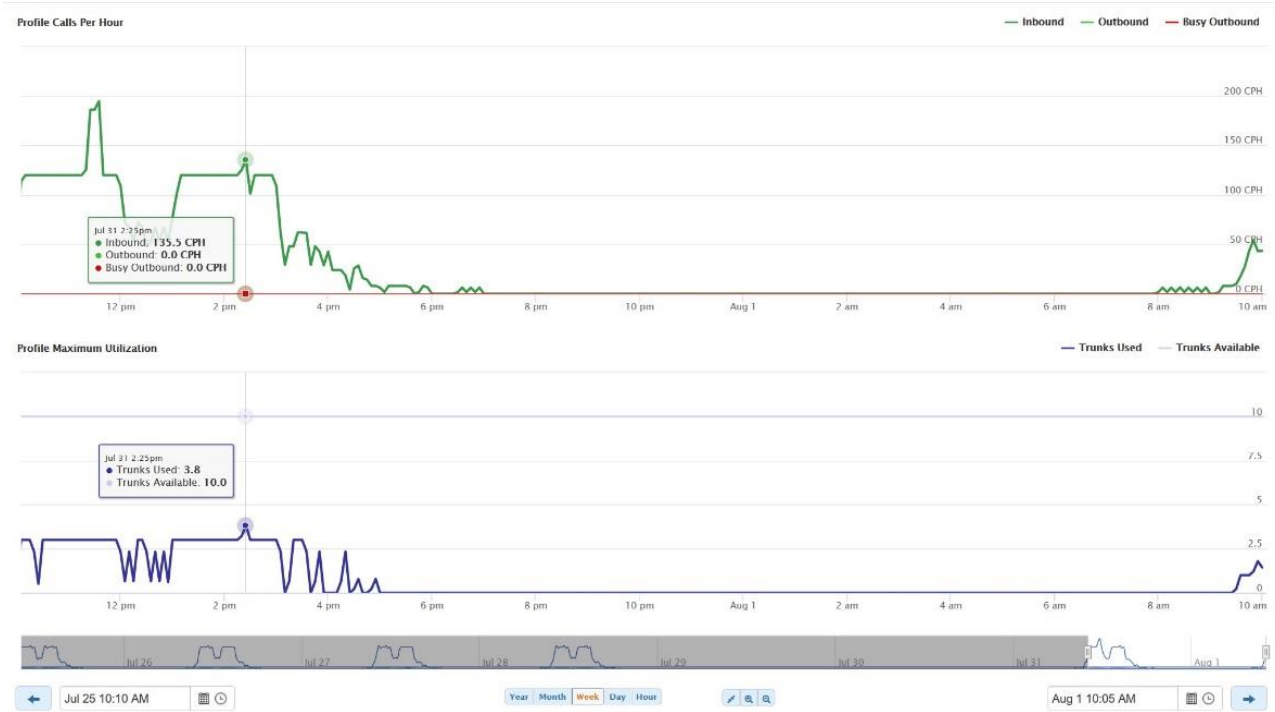
MPA Utilization Display

Mitel Performance Analytics (MPA) allows flexibility in how data is utilized and displayed. Users can view more granular utilization data over a customized time period.

This detailed data is available for up to 30 days, with daily summary values available after 30 days have elapsed.

The MPA utilization display includes reports for:

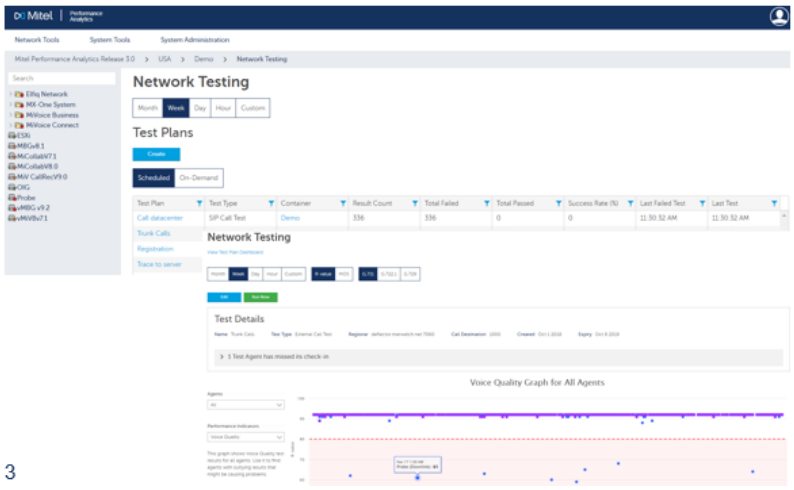
- MiVoice Business trunk utilization and SIP trunk utilization
- MiVoice Border Gateway trunk utilization



Mitel provides reports that show network utilization.

MPA Provides Advanced UC Network Testing

Mitel Performance Analytics (MPA) allows administrators to test VoIP and network performance, leveraging synthetic or test calls to quickly pinpoint problems associated with voice and video. After analysis, test results are represented in a clear graphical manner.



Run scheduled and on-demand synthetic call tests to quickly pinpoint performance problems with diagnostic tools customized to voice and video.

MPA Audit Log

The audit log file contains records of all actions performed on Mitel Performance Analytics (MPA) — when they were performed, who performed them, and where they were performed from. The CSV format audit log can be downloaded for review.

MPA logs will contain:

- All devices Create, Update, Delete.
- All remote access
- Admin user log-in
- User failed login (any)
- MiXML custom command (no details)
- Management Information Base (MIB) browser (no details)
- Connectivity test
- User edited (no details)

Those not logged are:

- Non-admin user log in
- User log out
- Query viewing

Feature	SWAS Tier	MiVoice Business
24/7 Technical Support	Premium	Y
MiVoice Business and MX-ONE - On Line Training	Premium	Y
Device Information	Premium	Y
Server Performance Metrics	Premium	Y
Reachability	Premium	Y
Device Alarms	Premium	Y
Performance Threshold Alarms	Premium	Y
MPA System Licensing IDs	Premium	Y
Licenses Used/Available - Mitel Systems	Premium	Y
Voice Quality Monitoring - Basic Troubleshooting	Premium	Y
Digital and SIP Trunk Utilization	Premium	Y
Single-click Remote Access	Premium	Y
On-premises or Cloud deployment option	Premium	Y
Inventory Reporting	Premium	Y
Emergency Response Alarms	Plus	Y
SD-WAN Link Monitoring	Plus	Y
Advanced VQ Reports	Plus	Y
User /Set / Service Inventory	Plus	Y
IPT User Dashboard	Plus	Y
Trunk Traffic Analytics - Recommendations	Plus	Y
MBG VQ Reports/ SIP Trunk VQ Reports	Plus	Y
Scheduled Device Group Operations	Plus	Y
SMDR record collection	Plus	Y
System backup, local or cloud storage	Plus	Y
Advanced Users Operations (MiVB cluster user management)	Plus	Y
Advanced UC Network Testing	Plus	Y
Platform - NON Dependant Device Support	Plus	Y
Third Party Device Support - SNMP Devices	Plus	Y
UPS	Plus	Y
Red Box Call Recording	Plus	Y
Innovation InnLine - Hospitality VM	Plus	Y
PathSolutions	Plus	Y
Windows Servers	Plus	Y
IP Switches-Routers	Plus	Y
ASC Call Recording	Plus	Y

Design Overview: Mitel Online Training

(This is part of Mitel Premium SWA Option)

- ***Mitel Training comes as part of Mitel Premium Software Assurance.*** If The County of Champaign plans to take an active role in management, moves, adds, and changes - the best path for Manufacturer training would be with the Mitel Premium Software Assurance. Pricing has been detailed under options. This provides an unlimited number of users additional manufacturer training at no additional cost and takes place online.

Course List Included in Premium SWA Training Subscription:

Platform	Target User	Online Courses	Mitel Course ID
MiVoice Business	Administrators	• MiVoice Business Moves Adds and Changes (MAC) Self Study NA • MiVoice Business Rel 8.0 System Administration Self Study NA • MiVoice Business Rel 8.0 Standalone ACD Self Study	• T-MVB-MAC-SS-NA • T-MVB-8.0-SA-SS • T-MVB-ACD-8.0-STD-SS
MiCollab	Administrators	• MiCollab Rel 8.0 System Administration Self Study	• T-MICOLLAB-8.0-SA-SS
MiCollab AM	Administrators	• MiCollab Advanced Messaging (AM) administration Self-Study	• Title in LMS catalog
NuPoint	Administrators	• Release 9.0 System Administration NuPoint Unified Messaging	• T-NPUM-9.0-SA-SS
Networking	Administrators	• Introduction to IPv6 Recorded Workshop • Beneath the Application: Network Dependencies for VoIP Networks Workshop • Introduction to T1/PRI/BRI Self-Study • Introduction to Wireshark Workshop • Session Initiation Protocol (SIP) Introduction Workshop • Simple IP Subnetting Review and Practice Workshop • Understanding Mitel Multi-Site Networks Workshop • Voice and Data Technology Primer Self-Study	• T-IPV6-INTRO-WS • Title in LMS catalog • Title in LMS catalog • Title in LMS catalog • Title in LMS catalog • Title in LMS catalog • Title in LMS catalog • Title in LMS catalog
	Administrators	• Administering your Contact Center • IVR Basics	• T-MICC-8.0-ADMIN-SS • T-MICC-8.0-IVR-BASICS-SS
	Supervisors	• Supervising your Contact Center	• T-MICC-8.0-SUPERVISE-SS
MiContact Center Business	Agents	• Utilizing Softphone / Phone set • Utilizing Ignite	• T-MICC-7.0-PHONESET-MGR-SS • T-MICC-IGNITE-USER-SS
	Administrators	• Administering your MiVoice Call Recording • Administering your Quality Management	• T-MIVOICE-CR-ADMIN-SS • T-MIVOICE-QM-ADMIN-SS
MiVoice Call Recording	Supervisors / Agents	• Using your MiVoice Call Recording • Using your Quality Management	• T-MIVOICE-CR-USER-SS • T-MIVOICE-QM-USER-SS
ICMI (Generic Contact Center)	Supervisors	**8 Courses** including: Forecasting, Staffing and Scheduling, Agent Coaching Series, Quality Monitoring Series, etc.	• Title in LMS catalog
	Agents	**5 Courses** including: Managing Customer Contacts with Quality, Managing Difficult Customers, etc.	• Title in LMS catalog
	Operations	**16 Courses** including: Establishing and Using Service Level and Response Time Objectives, Routing and Self-Service Options, Disaster Recovery, etc.	• Title in LMS catalog
	Customers	**8 Courses** including: Defining and Segmenting Customers, Measuring Customer Satisfaction, Cross-Functional Leverage, etc.	• Title in LMS catalog

Course wear will be added to the Premium Software Assurance entitlement as they become available on an ongoing basis from Mitel

TIG's Qualifications

Telcom Innovations Group

For the past 25 years, TIG has been one of the top ranked Mitel Partners in the World. Today, we have implemented more than 2000 similar systems which include some of the largest Education, State and Local Government in the Midwest. We have a proven track record of installing and building long term partnerships with our customers, some of our references have been with TIG from the very start of our company.

For most of these years, TIG has been the #1 Mitel Gold Partner in the Midwest and has been honored with numerous Mitel Awards and recognition – especially in the State, Local & Education vertical.

- *FY 2020, TIG has not received final rankings, but was ranked #2 in the World by Mitel for SLED (State & Local Government, and Education)*
- *FY 2019, TIG was ranked in the top 1% in the World by Mitel for total sales volume (there are over 4,000 Mitel channel partners worldwide).*
- *FY 2018, TIG was ranked #5 in the World by Mitel for SLED (State & Local Government, and Education)*
- *FY 2019, TIG was ranked #3 in the World by Mitel for SLED (State & Local Government, and Education)*
- *Mitel Highest customer satisfaction ratings*
- *#1 Partner in North America for Mitel UC Applications*
- *#1 Partner in North America for Mitel Contact Centers*
- *#1 Partner in North America for SLED*
- *Today, our small but highly experienced team holds more Advanced Mitel technical certifications than any other Mitel Partner in the Midwest.*

Technical Expertise & Experience are critical!

- TIG specializes in large Government & Education.

Some of our Customers include:

- **Walworth County (WI)**
- **DuPage County (IL)**
- **Kane County (IL)**
- **Boone County (IL)**
- **City of Champaign**
- **Champaign Public Library**
- **City of Urbana**
- **City Colleges of Chicago**
- **McHenry Community College**
- **Oakton Community College**
- **Columbia College Chicago**
- **Metra Rail (IL)**
- **Pace Bus (IL)**
- **Palatine CCSD 15 (IL)**

TIG has hundreds of additional locations including many local cities, villages, and school districts. References with required information have been submitted as part of our response and can be found in section 11 of our RFP response. TIG is happy to discuss and provide direct contacts for additional references upon request or even arrange a site-visit at a nearby customer!

Mitel Introduction

Mitel has been in business for 49 years and has always been known for their philosophy of offering great solutions that are able to phase into newer solutions while avoiding fork-lift upgrades. Users of Mitel products over 20 years ago still have the ability to upgrade those products and take advantage of today's technology while reusing a significant portion of their initial investment. TIG and Mitel are committed to giving extremely competitive discounts towards earning The County of Champaign's business.

Over the past several years, Mitel has made continuous improvements in the Unified Communications space. As part of this process, Mitel has shifted to a UCC (Unified Communications & Collaboration) user license model. This is not something that was widely adopted in 2012, at least not to the extent it is now with the realization of many businesses in 2020 were not prepared to leverage UC to its full potential.

UCC licenses include many additional features in the Mitel UC portfolio, which will meet & exceed all of the requirements of the RFP and protect the County's investment with Mitel and TIG. The UCC user license model provides a foundation that will allow uplifts to UCC Standard type licenses for a subset of users in the future should the need or desire arise. Many of TIG's customers during the Covid-19 pandemic have uplifted to these UCC Standard licenses to allow for business operations to continue seamlessly, since they not only provide MiCollab Client for internal presence and communications, but also remote teleworker capabilities and collaboration.

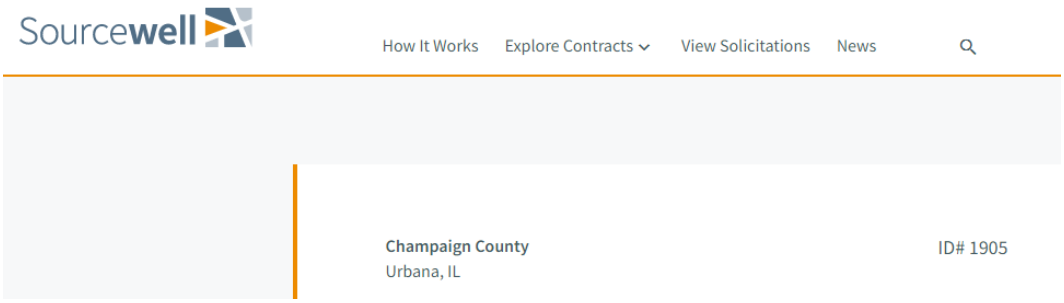
We are pleased to respond with a solution and a fresh look at what we can do with the Mitel MiVoice Business solution. TIG looks forward to sharing our modernization plan for The County of Champaign, and while there are many considerations to review – they afford a great deal of flexibility and allow us to tailor a unique solution that will meet the County's current and future needs.

Sourcewell Contract Pricing for Mitel

All pricing provided is the result of Mitel's continued Sourcewell (formerly NJPA) awarded contract #022719-MBS. This contact pricing ensures that The County of Champaign's current and future investments with TIG and Mitel will be discounted with national buying power levels with guaranteed discounts.

Mitel has been offering significant discounts though the Sourcewell (Previously NJPA) for almost 10 years and has secured multiple renewal terms with NJPA/Sourcewell.

Generally, these discounts offer **40% off Mitel List Price** on the vast majority of the product portfolio we commonly deploy including phones, licenses, and most Mitel Software Assurance subscriptions.

- ***The County of Champaign is an existing member of Sourcewell (Member ID # 1905)***
- 

- Contract Discount Protection for Pre & Post Cutover whether purchasing 1 additional phone or 1000 more!
- Generally, these discounts offer **40% off Mitel List Price** on the vast majority of the product portfolio we commonly deploy including phones, licenses, and most Mitel Software Assurance subscriptions.
- ***Sourcewell Contract Award to Mitel:*** https://www.sourcewell-mn.gov/cooperative-purchasing/022719-mbs
- ***Champaign County Existing Member ID:*** https://www.sourcewell-mn.gov/node/1520126

TIG: Key Team Members and Organizational Structure

Protect Your Investment With TIG's Customized Maintenance Plans!

Your business communication platform is the lifeline that keeps you connected to your organization's employees, customers, business partners, and vendors. We understand that reliable, up to date, fully functioning voice & data systems are a necessity in your organization's day to day operations.

We recognize that one size does not fit all, every organization is unique. TIG offers customized maintenance plans to our clients. The consistency and level of commitment we bring allows us to make outstanding service guarantees, we've listed a few of the most popular:

- ✓ Service Level Agreements
- ✓ Upgrades
- ✓ Remote Monitoring
- ✓ Managed Services
- ✓ Guaranteed Parts Availability
- ✓ Remote Support
- ✓ Reduced On-Site Labor Rates
- ✓ Priority Queuing
- ✓ Multi-year Discounts
- ✓ Service techs are on-call & available for after-hours emergency's
- ✓ **TIG's Professional Services include:**
  - Network Infrastructure Analysis Audit's
  - Network Design Sessions
  - Consulting Services
  - System Implementation & Training
  - Project Management
  - Technical Assistance Center (TAC) available 24 X 7
  - Certified Field Engineers available 24 X 7

Carrier Services: Telcom Innovations Group works with leading telecommunications providers to negotiate the best connectivity options for your facilities at the best price. We also offer complete network analysis to ensure the highest levels of quality and availability for your business communications. TIG will provide this consultation free (no contingency fees) to our clients who wish to reduce their telecommunications expenses without sacrificing service. Let us review and analyze your Local & Local Toll Calls, Long Distance, Internet, Point to Point Circuits, VoIP, VPN and DSL services with these carriers.

Project Management: When purchasing a new system you will be assigned a project manager. This will be your single point of contact and he/she will be there to ensure that implementation and training is completed in a timely and professional manner. Your assigned project manager will be here to assist you from beginning to end. We believe that the systems provided are only as good as their implementation and our job is not complete until our customers are a 100% satisfied.

Maintenance & Support: We are large enough to serve your needs yet flexible enough to allow customized maintenance programs. The consistency and level of commitment we bring to each of our clients allows us to make outrageous service guarantees. The true meaning of these guarantees is that you need not to worry that you will be left with a telephone system and/or a telephone company that has failed to perform to your organization's expectations.

We understand that a major concern for many businesses is the day-to-day task of administrating the common office technologies such as computers, LANs, and telephone systems; these often require a full time in-house manager. For years TIG has assumed this responsibility through its Technical Assistance Center (TAC), whose services are offered through our

maintenance plans. TAC is staffed with highly trained telecommunications specialists whose sole responsibility is to remotely administrate our customer's telecommunication system(s).

With today's technology it is critical to keep all high tech systems current with the latest manufacturer software loads. All of our manufacturers offer software assurance programs that when coupled with our TIG Maintenance Agreements, provide unparalleled system protection. **TIG is available 24 X 7 X 365** to implement these upgrades for you.

Today's technology requires all systems to stay current with the latest manufacturer software loads. All of our manufacturers offer software assurance programs which when coupled with our TIG Maintenance Agreements, provide the ultimate system protection. Our technicians are always available to support your team, contact TIG today to learn more.

Time & Material Service - Do It Your Way - Not interested in long term contracts, would you prefer to Pay-As-You-Go? TIG has very competitive time and material rates (T&M) for their clients. We offer a large array of services ranging from a simple change to a multi-phased network redesign and implementation with our professional services team.

Upgrades To Discontinued Systems - All technology has both a manufacturer and a user life expectancy. Sometimes, the manufacturer ends the life of a product before users want to retire the product. In the case of older phone systems, the Mitel SX-2000, Mitel SX-200, Mitel 200 ICP, Intertel Axxess, Intertel 3000, Intertel 5000 and the Toshiba DK Series, they still have a loyal following but have been discontinued by the manufacturer. TIG offers "best effort" support on discontinued products and a very generous migration program for those users who need to move to current technology.

TIG Service Organization

TIG works diligently to provide exceptional customer service and support to our clients. Our team responds efficiently and effectively to your requests.

Clients can submit service requests by phone, fax or email to the Technical Assistance Center (TAC). Once a ticket has been submitted, one of our certified technicians stays in constant communication with the customer to let them know the status of their request right up until the ticket has been closed. Please note that all service requests should be requested through TAC.

Technical Assistance Center (TAC)

TAC Main: (630) 616-4200 | TAC Fax: (630) 616-4300 | Email: service@ask-tig.com

Service hours

Normal service and requests: TIG's Technical Assistance Center is staffed from 8:00 AM to 5:00 PM C.S.T., Monday through Friday. Please submit your request by calling the service number or sending an email to service.

After-hours emergency service: On-call service technicians are available 24 Hours a day, seven days a week including holidays.

To request emergency support call the main service number at (630) 616-4200 and follow the voice prompts to page an on-call Technician.

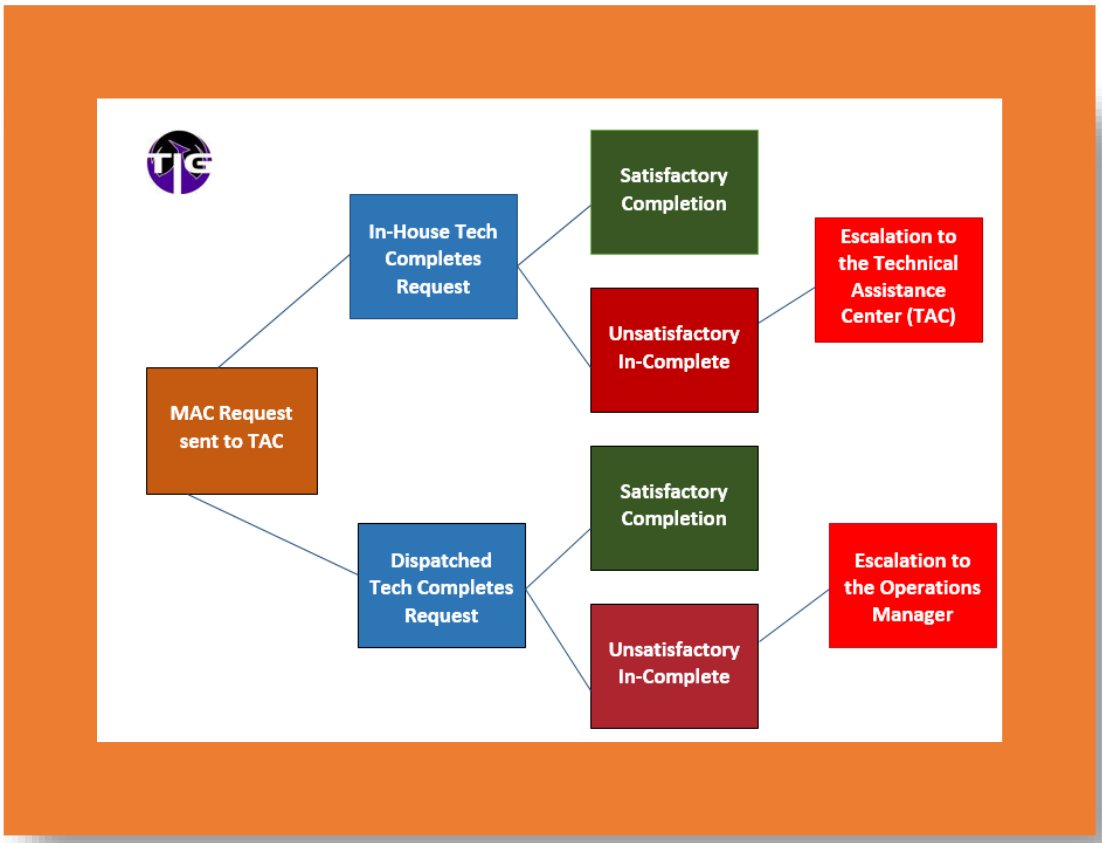
Please Do not send an email for emergency service requests.

Expectations for service calls: Emergency Service requests during business hours: A live service agent will take your call. Non-emergency service requests are generally handled within 24 hours. Emergency requests are generally handled within 4 hours.

After-hours emergency calls: You will be answered by a scripted auto-attendant intended to gather your site information. The on-call technician will be notified and you should receive a call back within 30-60 minutes.

E-mails to service: The TIG Service Center is equipped with the Mitel Contact Center solution which will generate an automatic email response. Normal email service requests are handled within 24 hours. **If you have an emergency request, please call TAC directly.**

If your request is not handled in a timely manner, please contact either President.



Key Team Members for the County of Champaign

Lead Project Manager

John Ernest
Project Manager Supervisor

Email: jernest@ask-tig.com
DID: 630-616-4241

- ✓ John has been with TIG for 22 years and has 25 years of experience in the voice industry. Prior to TIG he worked for Lucent/Avaya for 2 years after attending Northern Illinois University where he dual majored in History and Geology/Environmental Sciences.

- ✓ John's role is to be TIG's primary point of contact with the customer and to ensure a smooth, efficient, on-time implementation of the project. He will manage the development of the project plan, database and application discovery, equipment ordering, programming and installation and creation of a training curriculum.

- ✓ Holds every Mitel & AVST technical certification offered. Certifications include all of Mitel's PBX product lines, core voicemail, Call Center Management and Call Accounting, Collaboration and Conferencing applications. John also holds an Extreme Networks Design Professional certification. The list is several pages and will be provided upon request.

- ✓ He has worked on projects in a wide variety of verticals (industries) and locations across a dozen states and several countries as both a team member handling installation, trainings and as Project lead.

- ✓ Previous Project lead experience includes work with all of the following. Project Manager lead at City of Champaign, Champaign Public Library, Kane County Government, Walworth County Government, City Colleges of Chicago, Oakton Community College, Heartland Alliance, CCSD 15, Acceptance Insurance, School District 34, Schwarz Paper/Bunzel, Village of Oak Park, Crown Point Schools and implementation and training DuPage County and Applied. There are hundreds of additional installs as lead Project Manager that are part of John's experience.

Sr. Account Manager

Matthew Schwartz
Senior Solutions Architect
Responsible for overseeing account management, sales and TIG liaison pre/post cutover.

Email: **mschwartz@ask-tig.com**
DID: 630-616-4236

- ✓ 17 years of experience at Telcom Innovations Group
- ✓ Mitel, VMware, HP, Cisco Certifications

Lead Trainer

Shannon Carroll
Training Supervisor

Email: scarroll@ask-tig.com
DID: 630-616-4297

- ✓ 17 years of experience
- ✓ Mitel Certified Trainer.

Email: **scarroll@ask-tig.com**
DID: 630-616-4297

Lead Technician

To be Determined.

Lead Technician will be assigned once the project has been assigned. This will be determined by availability at the time.

TAC Supervisor

Dave Floyd
Email: dfloyd@ask-tig.com
DID: 630-616-4250

- ✓ 20+ Years Experience
- ✓ Holds every Mitel technical certification offered.

President

Randal J. Borchardt

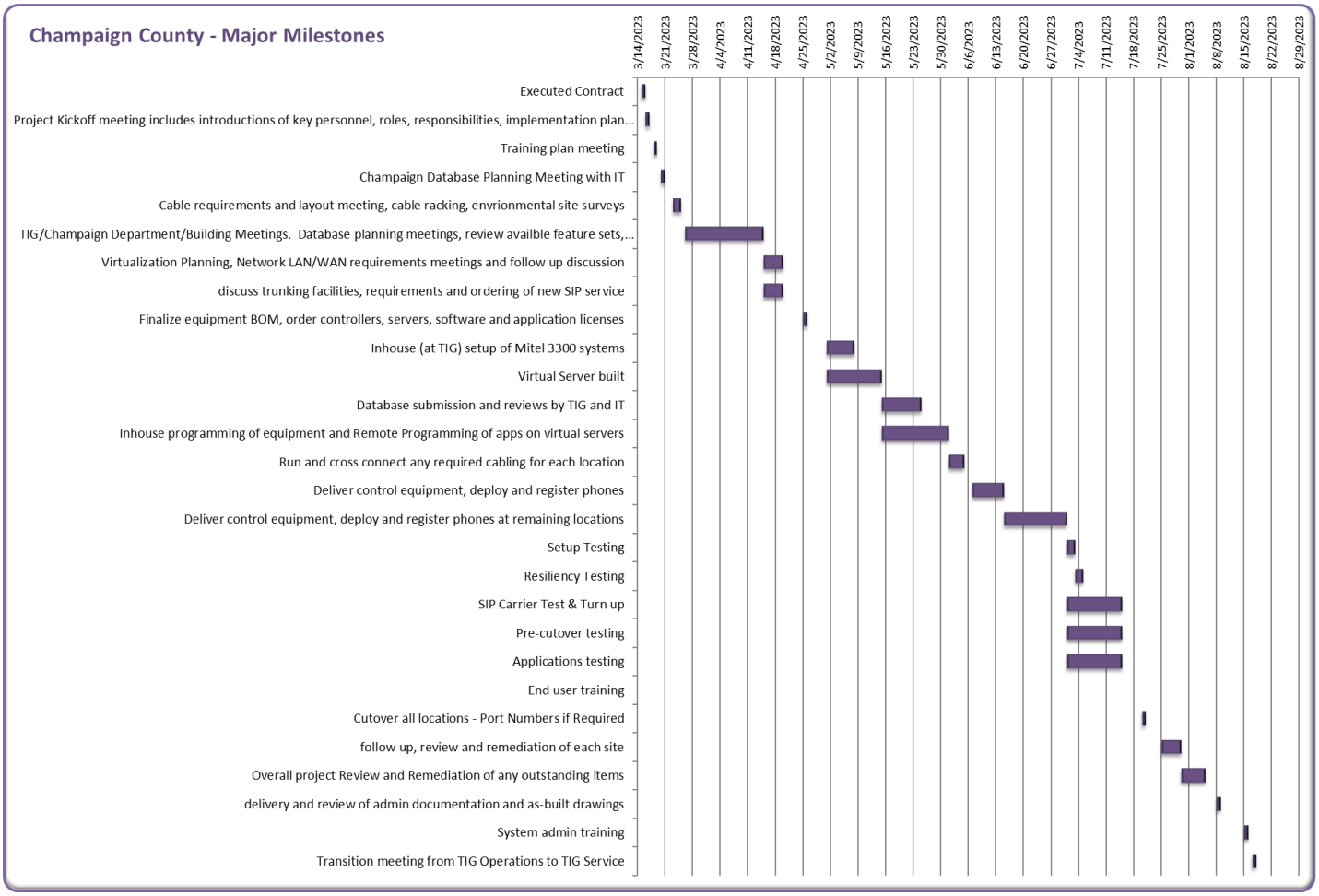
Email: rjborchardt@ask-tig.com
DID: 630-616-42325

- ✓ 40 Years Experience
- ✓ Mitel, VMware, HP, Cisco Certifications

Randy Borchardt	Co-President	rjborchardt@ask-tig.com	Direct: (630) 616-4225
Matt Schwartz	Sr. Account Mgr.	mschwartz@ask-tig.com	Direct: (630) 616-4236
John Ernest	Lead Project Mgr.	jernest@ask-tig.com	Direct: (630) 616-4241
Dave Floyd	TAC Supervisor	dfloyd@ask-tig.com	Direct: (630) 616-4250

TIG: Sample Project Schedule

Task Description	Start	End	Duration (days)
Executed Contract	3/15/2023	3/15/2023	1
Project Kickoff meeting includes introductions of key personnel, roles, responsibilities, implementation plan and order, timelines.	3/16/2023	3/17/2023	1
Training plan meeting	3/18/2023	3/19/2023	1
Champaign Database Planning Meeting with IT	3/20/2023	3/22/2023	1
Cable requirements and layout meeting, cable racking, envrionmental site surveys	3/23/2023	3/25/2023	2
TIG/Champaign Department/Building Meetings. Database planning meetings, review availble feature sets, applications and discuss programming templates	3/26/2023	4/15/2023	20
Virtualization Planning, Network LAN/WAN requirements meetings and follow up discussion	4/15/2023	4/20/2023	5
discuss trunking facilities, requirements and ordering of new SIP service	4/15/2023	4/20/2023	5
Finalize equipment BOM, order controllers, servers, software and application licenses	4/25/2023	4/26/2023	1
Inhouse (at TIG) setup of Mitel 3300 systems	5/1/2023	5/8/2023	7
Virtual Server built	5/1/2023	5/15/2023	14
Database submission and reviews by TIG and IT	5/15/2023	5/25/2023	10
Inhouse programming of equipment and Remote Programming of apps on virtual servers	5/15/2023	6/1/2023	17
Run and cross connect any required cabling for each location	6/1/2023	6/5/2023	4
Deliver control equipment, deploy and register phones	6/7/2023	6/15/2023	8
Deliver control equipment, deploy and register phones at remaining locations	6/15/2023	7/1/2023	16
Setup Testing	7/1/2023	7/3/2023	2
Resiliency Testing	7/3/2023	7/5/2023	2
SIP Carrier Test & Turn up	7/1/2023	7/15/2023	14
Pre-cutover testing	7/1/2023	7/15/2023	14
Applications testing	7/1/2023	7/15/2023	14
End user training	7/15/2023	7/15/2023	0
Cutover all locations - Port Numbers if Required	7/20/2023	7/22/2023	1
follow up, review and remediation of each site	7/25/2023	7/30/2023	5
Overall project Review and Remediation of any outstanding items	7/30/2023	8/5/2023	6
delivery and review of admin documentation and as-built drawings	8/8/2023	8/9/2023	1
System admin training	8/15/2023	8/16/2023	1
Transition meeting from TIG Operations to TIG Service	8/17/2023	8/18/2023	1



High Level Timeline dates are for demonstration purposes to provide Champaign County a better understanding of our process.

Deployment of each phase will have key dependencies defined following some of the initial meetings and joint decisions made. The MS Project Gantt Chart will become a working document with continuous updates throughout the remainder of the project. Each task will be assigned and our Project Manager will alert the County of any timeline risk factor.

TIG: References

VENDOR REFERENCE FORM #1

1. General Background

Company/Client Information:

Name: **City of Champaign**

City/State: **Champaign, IL**

Number of Employees: **573**

Annual Operating Budget: **$180M**

Project Manager/Contact Information:

Name: **Colleen Kilian**

Job Title: **Systems Administrator Information Technology**

Phone Number: **217-403-8970**

Email Address: **Colleen.Kilian@champaignil.gov**

2. Summary of Project and Current Status:

Please provide a concise description of the project, project budget, and project status including project start date and end date (or, if in progress, estimated end date). **City of Champaign signed with Telcom Innovations Group in November of 2017. Approximate project value $250,000.00 initial contract with subsequent renewal for the past 5 years. We are just ending the initial 5 year agreement and the City intends to renew TIG's contract for an additional 5 years with TIG and Mitel.**

3. Project Scope

Please indicate all modules/components/services that were implemented as part of the project: **City of Champaign installed the MiVoice Business Solution with (2) virtual Call Controllers at primary locations City Building and METCAD along with 7 purpose built Mitel 3300s. They also virtualized the MiCollab UC Server and Mitel Border Gateway. Approximately 450 UCC Standard tier licenses including voicemail, unified messaging, single number reach, MiCollab Client and softphones. Additional options selected were Mitel Call Accounting – also virtualized and NuPoint Speech Auto**

Attendant. 450 Mitel IP Phones installed included Mitel 6920s as standard and Mitel 6930s for administrative users. The same team that is slated for the County worked on the City, including Lead project manager and Sr. Account Manager.

4. Additional Information

Please include any additional information as attachments.

No additional attachments can be provided that are not publicly available. We encourage the Champaign County to reach out to Colleen to review the City's experience with TIG and the Mitel Solution, they will probably be willing to share greater details than we can provide in this RFP response.

VENDOR REFERENCE FORM #2

1. General Background

Company/Client Information:

Name: **Champaign Public Library**

City/State: **Champaign, IL**

Number of Employees: **63**

Annual Operating Budget: **$13M**

Project Manager/Contact Information:

Name: **Amy Al-Shabibi**

Job Title: **Technology Manager**

Phone Number: **217-403-5331**

Email Address: **aal-shabibi@champaign.org**

2. Summary of Project and Current Status:

Please provide a concise description of the project, project budget, and project status including project start date and end date (or, if in progress, estimated end date). **City of Champaign & Champaign Public Library signed with Telcom Innovations Group in November of 2017. Approximate project value $70,000.00 initial contract with subsequent renewal for the past 5 years. We are just ending the initial 5 year agreement and the Library has just renewed for Year 6 as of 1/31/23.**

3. Project Scope

Please indicate all modules/components/services that were implemented as part of the project:
Champaign Public Library installed the MiVoice Business Solution on a purpose built Mitel 3300 MXe III gateway and virtualized the MiCollab UC Suite. Installation included 150 UCC Standard user licenses including voicemail, unified messaging, single number reach, MiCollab Client and softphones. Phones selected were Mitel 6920s for all users.

4. Additional Information

Please include any additional information as attachments.

The County of Champaign – TIG Response

No additional attachments can be provided that are not publicly available. We encourage the Champaign County to reach out to Amy to review the Library's experience with TIG and the Mitel Solution.

VENDOR REFERENCE FORM #3

1. General Background

Company/Client Information:

Name: **City of Urbana**

City/State: **Urbana, IL**

Number of Employees: **127**

Annual Operating Budget: **$10M**

Project Manager/Contact Information:

Name: **Sanford Hess**

Job Title: **IT Director**

Phone Number: **217-384-2354**

Email Address: **sfhess@urbanaillinois.us**

2. Summary of Project and Current Status:

Please provide a concise description of the project, project budget, and project status including project start date and end date (or, if in progress, estimated end date). **Signed with Telcom Innovations Group in September of 2020. TIG project management and installation of a Ring Central solution. (Ring Central is the hosted/UCaaS solution for Mitel now)**

3. Project Scope

Please indicate all modules/components/services that were implemented as part of the project:

4. Additional Information

Please include any additional information as attachments.

No additional attachments can be provided that are not publicly available. We encourage the County to discuss Sanford's experience working with Telcom Innovations Group. Although, this is not the same solution – TIG is the same organization behind the City of Urbana's implementation.

VENDOR REFERENCE FORM #4

1. General Background

Company/Client Information:

Name: **Walworth County**

City/State: **Elkhorn, WI**

Number of Employees: **1000**

Annual Operating Budget: **$61M**

Project Manager/Contact Information:

Name: **Jackie Giller**

Job Title: **IT Director**

Phone Number: **262-741-7802**

Email Address: **jgiller@co.walworth.wi.us**

2. Summary of Project and Current Status:

Please provide a concise description of the project, project budget, and project status including project start date and end date (or, if in progress, estimated end date). **Signed with Telcom Innovations Group in May of 2019. Phased installation with major deployment prior to new Health & Human Services building.**

3. Project Scope

Please indicate all modules/components/services that were implemented as part of the project:

Installation of MiVoice Business Solution in hybrid environment of VMware and purpose built/industry standard servers. MiCollab Server, Call Accounting, and approximately 1300 extensions. 1200 phones deployed with majority being Mitel 6920 and administrative/answering points being 6930s. UCC Standard tier user licenses deployed for the majority (~1000) of standard and admin users, a number of subsequent add-ons for additional phones, headsets and user licenses over the past few years. A large add-on for advanced IVR was developed for Juror Scheduling database integration – Juror dials into system and it will return day of week, date of trial, juror call back, date juror should call back, etc. IVR outbound power dialer development for Human Services appointment reminders.

4. Additional Information

Please include any additional information as attachments.

No additional attachments can be provided that are not publicly available. We encourage the County to discuss Jackie's experience working with Telcom Innovations Group.

VENDOR REFERENCE FORM #5

1. General Background

Company/Client Information:

Name: **DuPage County**

City/State: **Wheaton, IL**

Number of Employees: **4000**

Annual Operating Budget: **$584M**

Project Manager/Contact Information:

Name: **Joe Bulaga**

Job Title: **Telecommunications Manager**

Phone Number: **630-407-5151**

Email Address: **joseph.bulaga@dupageco.org**

2. Summary of Project and Current Status:

Please provide a concise description of the project, project budget, and project status including project start date and end date (or, if in progress, estimated end date). **Installed with Mitel SX-2000 digital phones approximately 20 years ago by TIG. DuPage County is a growing agency that has added many sub-agencies under the County Government. Over time, the County upgraded to MiVoice Business systems which supported digital phones off peripheral nodes at the time. Approximately 2 years ago, a phased migration to MiVoice Business with IP phones was completed to refresh the remaining phones. Approximately 4,000 extensions are in place now.**

3. Project Scope

Please indicate all modules/components/services that were implemented as part of the project: **The current system are MiVoice Business with 6900 series Mitel IP Phones.**

4. Additional Information

Please include any additional information as attachments.

No additional attachments can be provided that are not publicly available. We encourage the County to discuss Joe's experience working with Telcom Innovations Group.

VM Resources for proposed applications

Note: our base proposal leverages the County's investment in virtual infrastructure for enhanced redundancies. All proposed software can be implemented on Industry Standard Servers and/or purpose built hardware if preferred.

# of Servers as propsed by TIG	Notes	VIRTUAL APPLIANCE	RELEASE	SYSTEM CAPACITY	CONFIGURATION		RESOURCE RESERVATIONS		EXPECTED MAXIMUM USAGE		MAX SIMULTANEOUS CALLS
					VCPU	DISK	CPU	MEMORY	NETWORK I/O	STORAGE I/O	
1	Primary UC Multi-App Server	MiCollab Virtual Multi-App	9.4	1500 USERS	4	90 GB	4 GHz	9.0 GB	5 MB/S	100 IOPS	
2	2 SIP Session Border Controllers	MiVoice Border Gateway Virtual	11.2	250 devices	2	20 GB	2 GHz	2 GB	1.7 MB/s	4 IOPS	125
1	Teleworker Server	MiVoice Border Gateway Virtual	11.2	1250 devices	3	40 GB	5 GHz	2 GB	5 MB/S	27 IOPS	250
2	Primary & Resilient Call Control Gateways	MiVoice Business Virtual	9.4	1500 devices	3	20 GB	3GHz	2 GB	25 Mb/s	28 IOPS	
1	E911/Life Safety Mass Notification. Requires Windows Server 2008/12/12r2/16/19	Mitel Revolution	v2022.2	Medium	4	200 GB	4 GHz	16 GB			

Mitel
Powering connections

Telcom Innovations Group

TIG Detailed Equipment Itemizaton 2.14.23

Base Proposal has been configured for:

1 **MiVoice Business - Primary (deployment on customer VM)**
Configured for up to 5,000 users - primary call control

1 **MiVoice Business - Resilient (deployment on customer VM)**
Configured for up to 5,000 users - Resilient call control

2 **MiVoice Border Gateways as SIP Session Border Controllers (deployment on customer VM)**
(25) SIP Trunk Channel Proxy Licenses each
(25) MiVoice Business SIP Trunk Licenses each

2 **MiCollab Multi-Application (deployment on customer VM)**
(38) NuPoint Voicemail & Auto Attendant ports
(20) Additional Mailboxes for Auto Attendant Greetings (1 per department)
MiCollab UC Client
MiCollab Softphones
(73) Audio/Web/Video conference ports

(Continued) Base Proposal has been configured for:

1 **MiVoice Border Gateway Teleworker Server (deployment on customer VM)**
For remote Teleworker users (remote physical/softphones)

635 **Unified Communications & Collaboration User Licenses**
(635) UCC Standard User Licenses for main answering point users
Multi-Device User License (Single # reach/Twinning)
Voicemail & Unified Messaging license
MiCollab desktop/web license w/ Softphone
MiCollab Mobile UC license w/ Softphone
(2) Teleworker Licenses (one for physical, one for softphone)

1 **Mitel Revolution - Life Safety & E911 Enhancements (deployment on customer VMware)**
(50) SLED Bundled Licenses
Each SLED bundle includes: 1 Desktop, 1 Mobile, 1 Endpoint license

635 **Mitel 6920w IP Phones**

3.5" QVGA color display, Wi-Fi dual band 802.11 a/b/g/n, Bluetooth 5.2, mobile integration, full duplex speakerphone, wired and wireless headset support

Primary MiVoice Business System (Brookens Administration or TBD)							
Part No.	**Description**	**Qty**	**Unit**	**Total**	**Disc**	**Unit**	**Total**
virtual MiVoice Business Primary							
54005748	MiVoice Business Virtual for Enterprise	1	1,495.00	1,495.00	40.00	897.00	897.00
54005330	Enterprise License Group	1	1,000.00	1,000.00	40.00	600.00	600.00
SIP Trunk x 25 Call Paths with SIP Session Border Controller							
54005339	MiVoice Border Gateway Virtual	1	250.00	250.00	40.00	150.00	150.00
54004491	SIP TRUNKING CHANNEL PROXY	25	50.00	1,250.00	40.00	30.00	750.00
54005400	MiVoice Business SIP Trunks x10	2	900.00	1,800.00	40.00	540.00	1,080.00
54002390	MiVoice Business License - SIP Trunk x1	5	100.00	500.00	40.00	60.00	300.00
Analog Terminal Adapters - 2 port, 4 port and 8 port based on location							
54004975	MiVoice Bus License - Enterprise User	33	175.00	5,775.00	40.00	105.00	3,465.00
51309161	TA7102 Universal (w/o AC cord)	9	210.00	1,890.00	40.00	126.00	1,134.00
51309162	TA7104 Universal (w/o AC cord)	1	415.00	415.00	40.00	249.00	249.00
51309163	TA7108 Universal (w/o AC cord)	3	630.00	1,890.00	40.00	378.00	1,134.00
50006271	PWR CRD C13 10A 125V - NA Plug	13	17.50	227.50	40.00	10.50	136.50
Mitel Software Assurance							
54009220	SWA Std 1y MiVBus System	1	138.60	138.60	40.00	83.16	83.16
54009221	SWA Std 1y MiVBus DLM	1	0.00	0.00	0.00	0.00	0.00
54009224	SWA Std 1y MiVBus User	33	11.87	391.71	40.02	7.12	234.96
54009229	SWA Std 1y MiV BG System	1	27.57	27.57	40.01	16.54	16.54
54009230	SWA Std 1y MiV BG SIP Connect	25	6.47	161.75	40.03	3.88	97.00
Total				**17,212.13**			**10,327.16**

Resilient MiVoice Business System (County Courthouse or TBD)

Part No.	Description	Qty	Unit	Total	Disc	Unit	Total
virtual MiVoice Business Resilient							
54005748	MiVoice Business Virtual for Enterprise	1	1,495.00	1,495.00	40.00	897.00	897.00
SIP Trunk x 25 Call Paths with SIP Session Border Controller							
54005339	MiVoice Border Gateway Virtual	1	250.00	250.00	40.00	150.00	150.00
54004491	SIP TRUNKING CHANNEL PROXY	25	50.00	1,250.00	40.00	30.00	750.00
54005400	MiVoice Business SIP Trunks x10	2	900.00	1,800.00	40.00	540.00	1,080.00
54002390	MiVoice Business License - SIP Trunk x1	5	100.00	500.00	40.00	60.00	300.00
Mitel Software Assurance							
54009220	SWA Std 1y MiVBus System	1	138.60	138.60	40.00	83.16	83.16
54009229	SWA Std 1y MiV BG System	1	27.57	27.57	40.01	16.54	16.54
54009230	SWA Std 1y MiV BG SIP Connect	25	6.47	161.75	40.03	3.88	97.00
Total				**5,622.92**			**3,373.70**

MiCollab Multi-Application UC Server, Mitel Border Gateway and User Licenses

Part No.	Description	Qty	Unit	Total	Disc	Unit	Total
virtual MiCollab Multi-App UC Server							
54005442	MiCollab Virtual Appliance	1	995.00	995.00	40.00	597.00	597.00
54005380	MiCClient Licnse - Peering Adv Server	1	0.00	0.00	0.00	0.00	0.00
54005381	MiCClient Licnse - Federation Adv Server	1	0.00	0.00	0.00	0.00	0.00
virtual MiVoice Border Gateway - Teleworker							
54005339	MiVoice Border Gateway Virtual	1	250.00	250.00	40.00	150.00	150.00
Additional Mailboxes - Auto Attendant x20							
54005610	MiCollab NPUM MiVBus Mailbox Licensesx10	2	350.00	700.00	40.00	210.00	420.00
Unified Communications & Collaboration User Licenses x635							
54006542	UCCv4.0 STND User for MiVoice Bus x1	35	325.00	11,375.00	40.00	195.00	6,825.00
54006543	UCCv4.0 STND User for MiVoice Bus x50	12	13,800.00	165,600.00	40.00	8,280.00	99,360.00
Mitel Software Assurance							
54009186	SWA Std 1y MiCollab System	1	110.25	110.25	40.00	66.15	66.15
54009189	SWA Std 1y MiCollab UM Mailbox	20	3.78	75.60	39.95	2.27	45.40
54009209	SWA Std 1y UCC Std MiVB	635	22.00	13,970.00	40.00	13.20	8,382.00
54009229	SWA Std 1y MiV BG System	1	27.57	27.57	40.01	16.54	16.54
Total				**193,103.42**			**115,862.09**

Mitel Revolution E911 & Life Safety Mass Notification - 50 SLED bundles 1 Year

Part No.	Description	Qty	Unit	Total	Disc	Unit	Total
Mitel Revolution Software - 12 month subscription							
51309959	Revolution SLED BNDL - up to 1000 (1 mo)	600	2.35	1,410.00	40.00	1.41	846.00
51309981	Mitel Revolution Subscrip Term (months)	12	0.00	0.00	0.00	0.00	0.00
51309983	Mitel Revolution for MiVB	1	0.00	0.00	0.00	0.00	0.00
Professional Services							
53004330	Mitel Revolution Service Solution	4,400	1.00	4,400.00	0.00	1.00	4,400.00
Total				**5,810.00**			**5,246.00**

Mitel IP 6900w Phones

Part No.	Description	Qty	Unit	Total	Disc	Unit	Total
Mitel 6900w Series Phones							
50008385	6920w IP Phone	635	405.00	257,175.00	40.00	243.00	154,305.00
Total				**257,175.00**			**154,305.00**

Cost Summary of Hardware & Software

Total	**$478,923.47**
Line Item Discounts	**-$189,809.52**
Total Hardware & Software	**$289,113.95**
Additional Public Sector Discount	**-$42,335.69**
Total Discounted Hardware & Software	**$246,778.26**

Public Sector Discount is a one time discount based on the above configuration
This quote is based on the Mitel Sourcewell (formerly NJPA) contract #022719-MBS

TIG Implementation

TIG Implementation Assumes a continguous installation of the entire project on an agreed timeline.

Project Management	
Network Analysis	
Installation - Core VoIP Systems	
Installation - Resilient VoIP Systems	
Installation - Database	
Installation - Applications	
Desktop Installation & Placement	
Training Sessions	
Cutover coverage - Follow-up	
1st Year TIG Enhanced Support & Maintenance (Included N/C)	
Total Implementation	**$90,000.00**

Grand Total - Base Proposal Phone System

Total Discounted Hardware & Software	**$246,778.26**
Total Implementation	**$90,000.00**
Base Proposal Phone System Total	**$336,778.26**

TIG Industry Standard Support & Mitel Standard Software Assurance Years 2 through 5

Mitel Software Assurance is subject to future additions of software. The pricing shown below for future years is based upon the current design and licenses quoted above. This pricing is subject to manufacturer price increases, but will continue to have applicable public sector discounts applied.

Year 2		
	TIG Industry Standard Maintenance	**$13,471.13**
	Mitel Standard Software Assurance	**$9,984.45**
		$23,455.58
Year 3		
	TIG Industry Standard Maintenance	**$13,471.13**
	Mitel Standard Software Assurance	**$9,984.45**
		$23,455.58
Year 4		
	TIG Industry Standard Maintenance	**$13,471.13**
	Mitel Standard Software Assurance	**$9,984.45**
		$23,455.58
Year 5		
	TIG Industry Standard Maintenance	**$13,471.13**
	Mitel Standard Software Assurance	**$9,984.45**
		$23,455.58

Option S13: Auto Dialer

Opt-S13 requires further discussion as described in RFP response Tab 4 Scope of Services. Our solution is fully capable of delivering a variety of auto-dialers, but will ultimately be dependent on the level of integration with other system(s); if any. TIG has experience deploying advanced Contact Center Solutions and has previously received Mitel's Contact Center partner of the year award. TIG has specific experience implementing Mitel IVRs and Auto Dialers specific to County Governement needs. This includes but is not limited to Juror notifications with database dips and Health and Human Services outcall appointment reminders.

Option S14: IVR

Opt-S14 will require some further discussion as descirbed in RFP response Tab 4 Scope of Services. TIG has a great deal of working experience deploying simple to very advanced IVRs - this ranges from a few ports for a small group of users to 1000 user Contact Center environments with full customization. Based on the Vendor Q&A, we may be able to accomplish the County's goals at a fraction of the price leveraging our MiCollab NuPoint Auto Attendant. We want to look at the solution wholistically, since many applications are complimentary (e.g. Mitel Call Accounting, Mitel Contact Center, IVR and Auto Dialer are all from the same suite of our Contact Center specific applications and there are economies of scale when deploying certain applications with one another). We are confident that we can find the appropriate IVR/AA solution for the County's current and future needs.

Option S15: Call Accounting - deployment on VM

Cradle to Grave reporting as described in section Opt-S15, Ancillary Questions #6 and Proposed Innovations TAB 6.

Part No.	Description	Qty	Unit	Total	Disc	Unit	Total
MiVoice Analytics - Mitel Call Accounting configured for 650 extensions and 1 administrator							
54006793	WG/CC System Administrator x1	1	850.00	850.00	40.00	510.00	510.00
54006796	MiVoice Call Accounting Starter Pack	1	1,300.00	1,300.00	40.00	780.00	780.00
54006797	MiVoice Call Accounting Extension x50	12	300.00	3,600.00	40.00	180.00	2,160.00
Mitel Software Assurance							
54006933	CC Standard Software Assurance	747	1.00	747.00	40.00	0.60	448.20
TIG Implementation & 1st Year Maintenance							
	TIG Labor	1		1,000.00			1,000.00
				7,497.00			**4,898.20**

Option S16: Call Backs

Opt-S16 will require some further discussion as described in RFP response Tab 4 Scope of Services. Callbacks can be implemented with ease once the ACD/Contact Center environment has been appropriately sized. Without knowing how many ACD agents/groups/paths the County may be looking at, we cannot price this until we do further discovery with this use case.

TIG Option #1: Mitel Premium Software Assurance

Mitel Premium Software Assurance is a highly recommended subscription uplift from the Mitel Standard Software Assurance included. Mitel Premium Software Assurance is mentioned and described in our RFP Response in the following sections; Tab 4: Scope of Services Warranty & Maintenace Support; Tab 4: Scope of Services T2; Tab 4: Scope of Services Opt-S1; and in full detail in Tab 6: Proposed Innovations. Major benefits include technical support upgraded from 8x5 from Mitel to 24x7, Mitel Performance Analytics (Proactive Monitoring) and Mitel University unlimited training.

Part No.	Description	Qty	Unit	Total	Disc	Unit	Total
Mitel Software Assurance uplift (this is based on TIG's base proposal and does not include any Optional applications)							
	uplift from Mitel Standard SWA to Premium	1	5,479.00	5,479.00	40.00	3,287.40	3,287.40
				5,479.00			**3,287.40**

TIG Option #2: Power Injectors to address non-PoE switching

Further discussion is requested - pricing provided is equipment only and does not include cabling or related labor. Best practices for all IP Phones in our industry is to centrally power with PoE Switches. If the existing investment in the County's Enterprise switching does not have Power over Ethernet, power injectors can be added to insert power into the Ethernet station cable. This offers protection in event of a power outage assuming the network rooms have generators or UPS. The alternative would be to add power bricks at every work station. Data Sheets for the proposed Power Injectors have been provided at the very end of Tab 15. If the County wishes to procure a different brand, install PoE switches, or AC power adapters, we are open to any solution and happy to discuss all available options pros and cons.

Part No.	Description	Qty	Unit	Total	Disc	Unit	Total
24 Port IEEE 802.3af Compliant 10/100/1000 with 15.4W output/port							
	PD6524G/AC/M/F	1				906.29	906.29
4 Port IEEE 802.3af Compliant 10/100/1000 with 15.4W output/port							
	PD-3504G/AC	1				175.08	175.08

TIG Option #3: Mitel 3300 Survivable Branch Office Gateways

Additional Mitel 3300 Local Resilient Gateways - offers additional protection from WAN failure + local PSTN trunking. Each Mitel 3300 CX SBO natively supports up to 150 phones with resilient fail-over, 6 Loop Start (POTS) and 4 ONSp (Analog Station ports)

Note: Labor & material is TBD until a finalized scope of work is generated for this section only.

Note: larger Mitel 3300s could be used instead of Primary and Resilient VM call control as proposed, further discussion is requested.

Part No.	Description	Qty	Unit	Total	Disc	Unit	Total
Mitel 3300 Survivable Branch Office Gateway							
52002547	3300 CX Analog Survivable Branch Office	1	3,050.00	3,050.00	40.00	1,830.00	1,830.00
50006266	3300 CX(i) II Controller SATA SSD	1	150.00	150.00	0.00	150.00	150.00
50006271	PWR CRD C13 10A 125V - NA Plug	1	17.50	17.50	40.00	10.50	10.50
Mitel Premium Software Assurance							
54007815	SWA Prem 1y MiVBus System	1	179.55	179.55	40.00	107.73	107.73
				3,397.05			**2,098.23**

TIG Option #4: Additional Phones & Accessories

Part No.	Description	Qty	Unit	Total	Disc	Unit	Total
6900 Series Phones							
50008301	6905 IP Phone	1	127.00	127.00	40.00	76.20	76.20
50006766	6910 IP Phone	1	209.00	209.00	40.00	125.40	125.40
50008385	6920w IP Phone	1	405.00	405.00	40.00	243.00	243.00
50008386	6930w IP Phone	1	520.00	520.00	40.00	312.00	312.00
50008387	6940w IP Phone	1	685.00	685.00	40.00	411.00	411.00
50008271	6970 IP Conference Phone	1	908.00	908.00	40.00	544.80	544.80
50008272	6970 Ext Microphones (2-pack)	1	325.00	325.00	40.00	195.00	195.00
6900 Series Accessories							
50006763	68xx/69xx Bluetooth Handset	1	190.00	190.00	40.00	114.00	114.00
50006874	M695 PKM	1	220.00	220.00	40.00	132.00	132.00
50006921	6900/6800 Wall Mount Kit (10 Pack)	1	319.00	319.00	40.00	191.40	191.40
51306580	BT Speakerphone	1	413.00	413.00	0.00	413.00	413.00
Mitel Headsets							
51305332	Integrated DECT Headset (NA)	1	358.00	358.00	40.00	214.80	214.80
51310035	H10 Stereo USB Headset	1	160.00	160.00	40.00	96.00	96.00
51310036	H20 Mono Analog Headset w/ QD Cable	1	235.00	235.00	40.00	141.00	141.00
51310037	H30 Stereo CC USB Headset w/ QD Cable	1	250.00	250.00	40.00	150.00	150.00
51310344	H30 Link Controller	1	94.00	94.00	40.00	56.40	56.40
51310038	H40 DECT Stereo Headset (NA)	1	445.00	445.00	40.00	267.00	267.00
Mitel 802.11 WiFi Phone							
51309245	Mitel 5634 WiFi Handset w /battery & clip	1	426.00	426.00	0.00	426.00	426.00
51015423	Mitel 5613/14/24/03/04/34 Charger (not EU)	1	62.00	62.00	0.00	62.00	62.00
51301221	Mitel 5613/14/24/34 Programmer	1	174.00	174.00	0.00	174.00	174.00

TELCOM INNOVATIONS GROUP

125 N. Prospect
Itasca, IL 60143
(630) 350-0700 FAX (630) 350-0711

Purchase Agreement
Data/VoIP Systems

Telcom Innovations Group (referred to as "Seller") and _____ (referred to as "Buyer") hereby agree as follows:

1. Seller hereby agrees to sell and Buyer hereby agrees to purchase the following equipment ("Equipment") subject to the following terms and conditions:

A. EQUIPMENT

QUAN.	DESCRIPTION

Note: For all digital carrier circuits (T-1, PRI & BRI), TIG will guarantee that all of the required DATA/VOIP hardware and software will be installed, programmed and tested by the providers due date. TIG cannot guarantee any services provided from third parties or their performance in delivering those services. Any failure of third party providers may result in additional charges from TIG.
Please note that all terms and conditions apply to all new equipment and cabling furnished by Seller directly. Any and all pre-existing cabling, telephone(s), telephone connection equipment, paging equipment, data devices to be reused by Buyer or otherwise not furnished by Seller, is not warrantied hereunder, or covered by TIG's Maintenance Agreement unless otherwise specified.
All cabling required to provide connectivity from Buyer's "Point of Presence," (also referred to as Net POP) provided by AT&T, Inc., is Buyer's responsibility to arrange for unless otherwise specified as part of the TIG itemization attached herein.
CUSTOMER PROVIDED SERVERS-All customer-provided servers will comply with manufacturer server specifications and minimally meet the specifications provided to you by your TIG Account Executive. All hardware, operating system and application software (SQL, Excel, Internet Explorer, etc.) required will be assembled, preloaded and tested prior to being shipped to TIG. Any labor required to bring any customer-provided equipment up to application specifications will be billed on an hourly basis at TIG's Professional Services labor rate.
The Pricing provided includes manufacturer incentives which require the return on certain components. These components must be returned to TIG within 2 weeks for the proposed pricing to be held. In the event the parts are not returned to TIG within 2 weeks, TIG will invoice the amount of the incentive back to the customer.

B. PURCHASE PRICE: $_____ (plus all applicable taxes).

C. TERMS OF PAYMENT
Buyer shall pay to Seller the total Purchase Price indicated in item B above. Terms of payment shall be one-half (50%) payable as deposit upon execution of this Agreement; 40% upon Equipment delivery; 10% payable upon cutover.

Seller acknowledges receipt of $_____ as deposit against the Purchase Price.

NOTE: Interest at the rate of one and one-half percent (1½%) per month will be charged on amounts not paid by Buyer when due.

IN WITNESS WHEREOF, the parties hereto have caused this, Agreement to be properly executed intending that it should be legally binding upon them and their respective heirs, successors and assigns.

Date: _____ Date: _____

BUYER: SELLER: Telcom Innovations Group

by: _____ by: _____

_____ _____

Title: _____ Title: _____

continued . . . .

Terms and Conditions Continued—

2. Limited Warranty and Limitation of Remedy.

a. Subject to all of the provisions of this Paragraph, Seller warrants for a period of 90 days (unless otherwise specified on the Equipment Description) from the Date of Installation of the Equipment for use by Buyer, that as of the Date of Installation the Equipment will be free from defects in material and workmanship. This warranty does not, however, extend to any item of Equipment which has been repaired, by anyone other than employees or authorized representatives of Seller, abused or improperly handled, stored, altered or used with third party material or equipment that is defected or of poor quality, or to any item of Equipment that has not been installed by Seller. The warranty stated above shall be in lieu of and excludes all other expressed or implied warranties including, but not limited to warranties of merchantability or fitness for a particular purpose or any warranty arising from course of dealing or usage of trade.

b. If Buyer notifies Seller of any defects covered by this warranty within the above stated 90 day period, Seller shall, at Seller's option, repair or replace the Equipment at its expense. Such repair or replacement shall be Buyer's exclusive remedy for breach of warranty, for negligence, or otherwise in connection with the transaction contemplated by this Agreement.

c. Seller shall not be liable for any special or consequential damages or for loss, damage or expense directly or indirectly arising under this agreement, arising from the use of the equipment sold hereunder, from buyer's in ability to use the equipment either separately or in combination with any other equipment or from any other cause.

d. Seller disclaims any express or implied warranty that its equipment is technically immune from or prevents fraudulent intrusions into and/or unauthorized use of the system (including its interconnection to a long distance network). Customer is hereby warned that fraudulent use of the system, including but not limited to DISA, Auto Attendant, Voice Mail, RMATS, 800, 888 and 900 service, is possible. Customer hereby assumes all risk of such fraudulent or unauthorized use or intrusion.

e. In the event of any manufacturer defects in the covered equipment, Telcom Innovations Group will provide the same remedies to the end user as the manufacturer provides to Telcom Innovations Group.

3. Seller's Installation Obligations.

Seller's services shall be limited to the installation of the Equipment on the Buyer's side of the equipment connecting the Equipment to the telephone system operated by the local telephone utility.

4. Buyer's Installation Obligations.

Seller agrees to deliver and install Equipment at Buyer's business premises ("Premises"). Buyer agrees to make the Premises available and ready for installation of Equipment and at its own expense including the furnishing of commercial power, the necessary environment and the access necessary to install and maintain the Equipment.

5. Seller's Security Interest.

Until such time as Buyer has paid Seller the Purchase Price in full, Buyer hereby grants and Seller hereby retains a purchase money security interest in the Equipment. Buyer agrees to execute all instruments (including financing statements) deemed necessary by Seller under applicable law to establish, maintain and continue perfected Seller's security interest in the Equipment or otherwise protect its rights in and to the Equipment. Seller agrees to furnish Buyer all documents necessary to release such security interest upon payment by Buyer of the Purchase Price in full.

6. Damages Upon Default.

a. Failure of the Buyer to perform any of its obligations under this Agreement, or the insolvency of Buyer, or the breach by Buyer of any warranty or representation hereunder of Buyer shall constitute a default by Buyer.

b. Should default by Buyer occur before delivery of the Equipment to Buyer's Premises, Buyer acknowledges that Seller in connection with the performance of this Agreement will have incurred costs and expenses to Seller's damage. Therefore, Buyer agrees that Seller may retain Buyer's deposit against the Purchase Price as liquidated damages upon default occurring before delivery of the Equipment.

c. Should default occur after delivery of the Equipment:

(i) Seller shall have the right to enter any premises, and may without breach of the peace, take possession of the Equipment and take any other remedy available to it and Buyer shall pay all reasonable costs incurred by Seller in repossessing the Equipment, plus the costs of resale and all costs of collection and interest at the rate of one and one-half percent (1½%) per month on the full balance due of the Purchase Price; and

(ii) Seller shall be entitled to receive damages actually incurred by it as a result of such default including loss of profits.

d. The above remedies shall be cumulative and shall not preclude the exercise of any of Seller's rights available to it under law. Failure to enforce a breach shall not preclude later enforcement.

7. Attorney's Fees.

Buyer agrees to pay, upon demand, any and all costs, fees and expenses, including attorney's fees, incurred by Seller in enforcing any of Seller's rights hereunder.

8. Amendment and Construction.

Any changes in the terms of this Agreement or to any of the Schedules attached hereto and made a part hereof, or any waiver or termination hereunder, shall be effective only if in writing, signed by an authorized representative of Buyer and authorized representative of Seller. The parties hereto agree that this Agreement shall be governed and controlled by the laws of the State of Illinois, to the exclusion of the law of any other forum and without regard to the jurisdiction in which any action or proceeding may be instituted. Any part or parts of this Agreement which is or are declared to be invalid, unenforceable, null and void, or unconstitutional shall not affect the validity of the remaining provisions thereof.

9. Risk of Loss.

Buyer's risk of loss for any damage to or destruction of the Equipment commences upon delivery to Buyer's Premises, regardless of any breach by Seller, and shall be borne by Buyer except for damage due to the willful misconduct of Seller.

10. ENTIRE AGREEMENT.

Buyer has carefully read all provisions of this agreement. This agreement constitutes the complete and exclusive statement of the terms and conditions. There are no representations, warranties or stipulations; written or oral, not herein contained.

Until accepted and signed by an officer of seller at its principal office, this agreement shall not become effective and shall not constitute a binding contract.

11. Force Majeure.

The timeliness of performance by Seller of its obligations under this Agreement is in every case subject to delays caused by acts of God, war, riot, fire, explosion, accident, flood, sabotage, inability to obtain fuel or power, governmental laws, regulations or orders, acts or inaction of Buyer, inability of Seller's subcontractors to perform, or any other cause beyond the reasonable control of Seller, or labor trouble, strike, lockout or injunction (whether or not such labor event is within the reasonable control of Seller). In the event of any such delay, the period of time for performance of services affected by such delay will be extended to reflect the effective delay occasioned thereby.

12. Assignment.

Seller may assign, subcontract, transfer or otherwise dispose of, in whole or in part, any of its interests, rights or obligations under this Agreement. Buyer shall not assign or subcontract any part or all of its interests hereunder except upon written consent of Seller, which consent shall not be unreasonably withheld, and any attempted assignment or subcontracting without Seller's prior written consent shall be null and void.

TELCOM INNOVATIONS GROUP
125 N. Prospect
Itasca, IL 60143
(630) 350-0700 FAX (630) 350-0711

Maintenance Agreement
Telecommunications System
TIG Enhanced

Customer:

Term 1 Year

System(s) _____ Anniversary Date _____ Effective Date _____

Software _____ Contract No. _____ Annual Charges _____

TERMS AND CONDITIONS

1. MAINTENANCE SERVICES

Pursuant to the terms and conditions of this agreement (Agreement), Telcom Innovations Group shall provide the Customer during the Term of this Agreement, including any renewal Term, and with respect to the Equipment, the services summarized as follows:

- Ongoing consultation to assure both system and users optimum working conditions.
- Remedial maintenance services upon request by the Customer in order to restore malfunctioning operating component parts of the Equipment to proper working order.
- Guaranteed spare parts availability or a penalty fee of $1,000.00 per day payable to Customer until the repair is completed.
- 30 Minutes of Remote Minor Moves and Changes reprogramming performed same Business Day as requested at no additional fee, if system is so equipped.
- Ongoing user training for individuals and or groups made available upon request.

Telcom Innovations Group' remedial maintenance response objectives are as follows:
With respect to a major malfunction of the Equipment defined in the following parameters: no incoming or outgoing telephone service, or no station to station service within the telephone system, or attendant console is unable to answer and/or transfer calls, or fifty percent or more of the C.O. trunks and/or stations are in an inoperable state, Telcom Innovations Group' policy is to arrive at the Customer's premises within four (4) hours from the time Telcom Innovations Group first receives the Customer's request for remedial maintenance and will complete such repairs as soon as reasonably practicable.

With respect to minor malfunctions (any malfunction other than a major malfunction) of the Equipment, Telcom Innovations Group' policy is to arrive at the Customer's premises during that or the next Business Day Telcom Innovations Group first receives the Customer's request for minor remedial maintenance and will complete such repairs as soon as reasonably practicable. Routine or minor remedial maintenance requested to be performed after normal business hours will be billed to the Customer at Telcom Innovations Group' then current overtime hourly rate with a minimum two (2) hours' service charge. For purposes of this Agreement, "Business Day" shall mean 8 A.M. to 5 P.M., Monday through Friday, excluding holidays.

Telcom Innovations Group' responsibility with respect to maintenance services shall be limited to the Customer's side of the point of connection between the Equipment and the local telephone company.

The Customer shall allow employees and authorized representatives of Telcom Innovations Group free access to the premises and facilities where the Equipment is to be maintained at all hours consistent with the requirements of this Agreement.

Any service related issues that occur on equipment containing manufacturer's discontinued hardware and/or software that may require manufacturer's support will be repaired on a T&M basis. In the event of any manufacturer defects in the covered equipment, Telcom Innovations Group will provide the same remedies to the end user as the manufacturer provides to Telcom Innovations Group.

CUSTOMER ACKNOWLEDGES THAT HE HAS READ ALL OF THE PROVISIONS OF THIS AGREEMENT INCLUDING THOSE ON THE REVERSE SIDE HEREOF. THIS AGREEMENT CONSTITUTES THE COMPLETE AND EXCLUSIVE STATEMENT OF THE TERMS AND CONDITIONS AGREED UPON. THERE ARE NO REPRESENTATIONS, WARRANTIES, OR STIPULATIONS; WRITTEN OR ORAL, NOT HEREIN CONTAINED. NO MODIFICATION OF THIS AGREEMENT MAY BE MADE EXCEPT BY WRITING EXECUTED BY AN OFFICER OF TELCOM INNOVATIONS GROUP. THIS AGREEMENT SHALL NOT BE EFFECTIVE UNTIL SIGNED BY AN OFFICER OF TELCOM INNOVATIONS GROUP, INC.

CUSTOMER:	TELCOM INNOVATIONS GROUP
by: _____	by: _____
Title: _____	Title: _____
Date: _____	Date: _____

Should Telcom Innovations Group fail to complete requested remedial maintenance services within twenty-four (24) hours after arrival at Customer's premises due to the unavailability of spare parts, then for each additional 24-hour period that the remedial maintenance services are not substantially completed, Telcom Innovations Group will pay to the Customer a penalty fee of One Thousand Dollars ($1,000.00).

If the Customer's system is equipped for remote reprogramming, Telcom Innovations Group will perform requested remote Minor Moves and Changes Reprogramming during the same Business Day requested without charge. For purposes of this Agreement, "Minor Moves and Changes Reprogramming" shall mean any remote reprogramming which may be completed within a period of thirty (30) minutes. Remote reprogramming requested to be performed during a Business Day which requires in excess of thirty (30) minutes to perform will be billed to the Customer at Telcom Innovations Group' then current hourly rates. Remote reprogramming requested to be performed after normal business hours will be billed to the Customer at Telcom Innovations Group' then current overtime rates.

During the initial Term and each renewal Term Customer may request, without charge, two (2) one-half-day user training sessions for Customer's personnel. Training sessions shall be scheduled during Business Days by arrangement with Telcom Innovations Group' training department. Additional training requested shall be billed to Customer at Telcom Innovations Group' then current hourly rates.

If during the Term hereof any person other than an employee or authorized representative of Telcom Innovations Group performs any maintenance or service work on the Equipment, then the obligations of Telcom Innovations Group hereunder shall immediately terminate.

For purposes of this Agreement, the term "Equipment" shall mean all new telecommunications equipment and cabling furnished directly to Customer by Telcom Innovations Group before the Effective Date or the Anniversary Date, if applicable. Unless otherwise specifically agreed upon by Telcom Innovations Group in writing, the term "Equipment" shall not include any pre-existing cabling, telephone(s), telephone connection equipment, paging equipment, data devices or other telecommunications equipment reused by Customer or otherwise not furnished by Telcom Innovations Group.

Maintenance does not include any services necessitated by, or of the type described in, any of the following:

Labor and material costs of additions, changes, relocations and removals: operating supplies and accessories; specification or engineering changes; Labor and material costs for replacement of those component parts subject to normal wear and tear as a result of use which do not affect the operational condition of the Equipment; Negligent, willful or intentional acts of Customer or any third party; Accident, casualty, neglect, misuse or any cause other than normal use in the manner intended by the parties hereto as described in the Equipment specifications; An act or event occurring external to the Equipment which causes, either directly or indirectly, a failure or malfunction in the Equipment, including without limitation, failures or malfunctions of the trunk or toll lines, cable or other equipment connecting the Equipment to the telecommunications system of the operating telephone utility or abnormal power fluctuations or failures which adversely affect the Equipment; Repair or maintenance or increase in normal service time resulting from Customer's failure to provide a suitable environment as required in the Equipment specifications or any other failure of the Customer to fully perform its responsibilities under this Agreement; Any other acts or events which may adversely affect the performance of the Equipment, occasioned by acts of the Customer or any third party, or the use by the Customer or any other third party of the Equipment in combination with any other apparatus, device of other system not supplied, or approved as to such combined use by Telcom Innovations Group, or the use by the Customer of any item of the Equipment in a manner not intended by the parties hereto or specified by Telcom Innovations Group.

2. TERM AND PAYMENT

The term of this Agreement shall commence as of the Effective Date and will cover a period of one year, unless a period other than one year is expressly stipulated in the space provided on the reverse side hereof. Payments due from the Customer to Telcom Innovations Group hereunder shall be made on or before the Effective Date of this Agreement. In the event payment is not made at said time, Customer will be billed for time and materials at Telcom Innovations Group' then current rates. On the Anniversary Date of this Agreement, any additional equipment to be covered will result in an increase of the maintenance service rates or other charges (Annual Charges) which are to be paid on or before the Anniversary Date.

This Agreement will automatically renew for an additional period of one (1) year on each Anniversary Date unless terminated by the parties. Either party may terminate this Agreement upon thirty (30) days written notice to the other party, except that this Agreement shall immediately terminate upon notice from Telcom Innovations Group to Customer in the event that Customer shall fail to pay the Annual Charges hereunder.

3. TAXES

The Annual Charges incurred by Customer under this Agreement do not include any federal, state or local privilege, use, sales or excise taxes paid or payable by either Telcom Innovations Group or Customer with respect to this Agreement or any of the services performed or materials, equipment or other items provided by Telcom Innovations Group or Customer, except for taxes based on Telcom Innovations Group' net income on capital stock, which shall be borne by Telcom Innovations Group.

4. LIMITATION OF LIABILITY

The Customer agrees that neither Telcom Innovations Group nor its subcontractor shall be liable for any loss or damage to the Equipment or other property or injury, or death to the Customer's agents, employees, or customers arising in connection with the maintenance services provided by Telcom Innovations Group or its subcontractor under this Agreement unless such loss, injury, death or damage results solely from the gross negligence or willful misconduct of Telcom Innovations Group officers, employees, or agents.

IN NO EVENT SHALL TELCOM INNOVATIONS GROUP OR ITS SUBCONTRACTOR BE LIABLE FOR ANY INDIRECT, INCIDENTAL, CONSEQUENTIAL OR SPECIAL DAMAGES (INCLUDING, WITHOUT LIMITATION, ANY LOSS BY CUSTOMER OF BUSINESS, REVENUES OR GOODWILL), ARISING IN CONNECTION WITH THIS AGREEMENT OR EQUIPMENT.

5. FORCE MAJEURE

The timeliness of performance by Telcom Innovations Group of maintenance services hereunder or the performance of any other obligations of Telcom Innovations Group under this Agreement is in every case subject to delays caused by acts of God, war, riot, fire, explosion, accident, flood, sabotage, inability to obtain fuel or power, governmental laws, regulations or orders, acts or inaction of Customer, inability of Telcom Innovations Group subcontractors to perform, or any other cause beyond the reasonable control of Telcom Innovations Group, or labor trouble, strike, lockout or injunction (whether or not such labor event is within the reasonable control of Telcom Innovations Group). In the event of any such delay, the period of time for performance of services affected by such delay will be extended to reflect the effective delay occasioned thereby.

6. ASSIGNMENT

Telcom Innovations Group may assign, subcontract, transfer or otherwise dispose of, in whole or in part, any of its interests, rights or obligations under this Agreement including, without limitation, Telcom Innovations Group' obligation to provide maintenance services, provided that Telcom Innovations Group first gives adequate prior written notice thereof to the Customer. Customer shall not assign or subcontract any part or all of its interests hereunder except upon written consent of Telcom Innovations Group, which consent shall not be unreasonably withheld, and any attempted assignment or subcontracting without Telcom Innovations Group' prior written consent shall be null and void.

7. GOVERNING LAW

The parties hereto agree that this Agreement shall be governed and controlled by the laws of the State of Illinois, to the exclusion of the law of any other forum and without regard to the jurisdiction in which any action or proceeding may be instituted. Any part or parts of this Agreement, which is or are declared to be invalid, unenforceable, null and void, or unconstitutional, shall not affect the validity of the remaining provisions thereof.

LAN/WAN Design Guidelines for the Implementation of VoIP Platforms

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This Technical Bulletin is intended for Customer Service and Installation personnel involved in the installation of VOIP Platforms.

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1. Network Guidelines for Voice over IP Installations

The following information is to be used in determining the suitability and requirements for a Voice over IP installation.

The VOIP platform includes a number of functions such as gateway between IP and TDM, call control, as well as TDM and PSTN connections. Each part may be described separately or as a part of the overall unit, sometimes also referred to as the controller.

The contents of this document should be used in assessing the capabilities of a particular network with respect to maintaining voice quality and usability of the IP-Phones and associated controllers.

Networks by definition do not always follow specific architectures, so whilst every effort is made to give accurate information, requirements may differ between different installations. As a result the information enclosed is typically generic in nature. Specific information on how the configure the VOIP platform and network equipment should be referred back to manuals and relevant training on those devices.

1.1 Executive Summary

The main requirement in assessing and configuring the network is maintaining the voice quality and functionality to the user. This may require that certain changes take place within an existing network, or that equipment with certain capabilities is installed.

The main issues that affect the voice quality within a network are:

- Network **Delay**
- Network **Jitter**
- Network **Packet Loss**

Care has been taken in the design of the IP-Phones and controllers to cater for delay through the inclusion of echo cancellation devices. The jitter and a certain degree of packet loss are also taken care of by the inclusion of jitter buffers and the mechanism to control these.

In implementing a network to handle Voice over IP the following areas need to be considered. These are recommendations, and there will always be exceptions, but these should be considered:

- **QoS (Quality of Service)** Quality of service is that provided to the user, not network equipment settings. However, certain network equipment configurations can greatly assist in ensuring adequate QoS to a user. These include:
  - **IEEE802.1p/Q**: This may also be known as VLAN Tagging, priority or COS (different from the telecom Class of Service). This operates at layer2 to ensure highest priority for voice traffic.
  - **DiffServe**: This is a fixed field in the Layer3 information that is also used to define different service categories, through TOS, priority and Precedence. DiffServe and Type of Service are similar, with the older Type of Service values being backward compatible into DiffServe.
- **Switched Networks**: Use switched networks, which then allow full bandwidth capability to all end points. Networks with Hubs include shared bandwidth and no priority mechanisms are available, see above.
- **Network Topology**: The networks should be designed in a hierarchical manner where bandwidth between devices is controlled and understood. Simply linking switches in a long chain will work for data, but this also introduces bottlenecks between devices that are unnecessary, as well as introduction of jitter.
- **Network Pre-Installation and post-installation analysis**: The network should be investigated before installation to determine suitability for Voice over IP. The following sections of the document will provide guidelines of areas to investigate. Once an installation is completed, it should also be tested to ensure that the guideline limits are not being exceeded.
- **NAT and Firewall**: Although there are emerging standards to allow Voice over IP through firewalls and NAT devices, these are still in early development. Typically to allow voice through a firewall a number of ports need to be opened up, since one controller may use a range of ports that are dynamically assigned. Opening up all possible ports negates the usefulness of the firewall. NAT needs to change addresses, but may have difficulty in mapping a single controller device to multiple Internet addresses, or translating IP addresses that are buried in control messages. Generally these issues are overcome through the use of VPNs.
- **VPN**: Virtual Private Networks are simply a pipe or tunnel across an ISP network which allows a remote device to react as though it was still connected to the enterprise network. Beware that the VPN may be across an unknown network. It may be required to get certain Service Level Agreements (SLA) to ensure timely delivery of data. Where encryption is used additional delay may also be added to the data.

2. Summary of Guidelines

In brief, the guidelines are exactly that: guidelines. Because LANs are so diverse and equipment changes so quickly the following recommendations are listed below to provide the best operating conditions.

- Use networks with VLANs (IEEE802.1p/Q) with dual port phones
- The network should be fully switched. Hubs do not support priority queuing.

- The ports must allow for the interface speed to be configured either manually or automatically.
- Routers or Layer3 switches must be available to connect between VLANs
- Spanning Tree should be disabled at the controller connection (pre release4.0).
- Only one LAN connection should be made from the ICP controller to the network
- The controller should be located behind a network Layer2 switch
- Ensure that the PPS rate of the routers and switches is adequate for the amount of voice traffic expected
- Wherever possible, provide the most bandwidth. Use Full duplex in preference to Half duplex.
- If the network consists of multivendor units, do they all inter-work correctly?
- Use MTU on routers especially for slower speed links (anything less than T1 rates)
- Ensure that end-to-end delay, jitter and packet loss are within acceptable bounds
- Ensure that there is sufficient bandwidth on a WAN link for the amount of expected traffic. Don't overload, otherwise everyone suffers
- Provide a realistic blocking number for IP Trunking restriction, i.e. consider bandwidth
- Don't share the voice VLAN with data devices
- Don't put servers or printers behind a dual port phone, provide a dedicated port for these devices.
- Ensure Routers support DHCP forwarding, or provide multiple DHCP servers and copy phone specific information between DHCP servers to ensure phones start up correctly.
- Ensure Routers support 'ICMP Redirect'. This reduces bandwidth requirements when the 'default gateway' device is not the correct one to direct traffic to.
- To get the maximum data rate from phone, connect a 100BaseT NIC on the PC to the phone and ensure that it is configured for 'auto-negotiation'. The phone will default to the slowest speed for both ports. The faster, the better!
- Ensure CAT5 or better cabling is installed to get best performance. CAT3 does work, but only up to 10BaseT. CAT6 may be needed for patch cables if a number of patch panels are used in a wiring run.
- The controller uses some internal IP addresses in the range 192.168.10.x/24 to 192.168.13.x/24. Ensure that these addresses cannot be reproduced elsewhere in the network.

3. Guidelines and Explanations

3.1 Introduction

The main issues that affect system installation and user perceptions are:
- Quality of service: **Voice quality during the call**., and
- Availability of the service: **Setting up and Clearing voice connections** (signalling).

The challenge is to engineer the network to ensure that these quality requirements are met. In the TDM world, this is possible by providing dedicated connections to the desk. In the IP world the network has to share connections with other devices, such as PCs. The requirements of the PC and an IP-Phone differ, and this is where the challenge starts. The PC requirement is to send data as quickly as possibly using all available bandwidth. The IP-Phone on the other hand has limited data, but it must be sent and received on a very regular basis with little variation (jitter).

In summary this can be considered as placing connection oriented devices into a connectionless environment and still maintaining expected operation.

3.2 Terminology Explanations

Some areas that affect the installation are described below with a brief explanation of their importance:

3.2.1 Delay

As delay increases in a conversation it becomes increasingly difficult to hold a normal two-way conversation. Such a conversation rapidly changes from an interactive conversation to an 'over to you' radio conversation. This starts to become apparent at about 150ms to 200ms, and is definitely apparent by 400ms delay. The phones and gateway, in the controller, introduce some necessary delay. The guidelines identify the delays that can be tolerated to ensure that conversation voice quality is maintained.

3.2.2 Echo

Echo generally results from poor termination of a PSTN line or acoustic feedback. When delay is short, this is usually not heard due to the level of local side-tone. But, as delay is introduced, this echo becomes noticeable. To counteract this, the gateway device includes echo cancellation up to 64ms looking towards the PSTN. The IP-Phone includes echo-suppression to remove acoustic echo.

3.2.3 Jitter

This is the variation in delay that can occur in networks. The major source is generally due to serialisation delay. This occurs when a packet cannot be sent at the ideal time because another packet is already being sent on the same connection. The result is that the packet must wait. For high-speed links a maximum packet of about 1500 bytes will be sent in microseconds, so jitter is negligible. However for slower WAN connections, such as over a Frame Relay connection, this delay becomes significant.

3.2.4 Packet Loss

Packet loss within the network can occur for a number of reasons. The main ones include congestion of a connection. At some point the buffers overflow and data is lost. Packets may also be lost at the gateway or IP-Phone device because the jitter is so variable that the packet arrives too late to be used for voice. Out of sequence packets can also occur over WAN connections. These look like packets with excessive jitter and hence result in packet loss.

Although some packet loss can be handled on an ongoing basis, if the loss becomes bursty the user will start to notice. Thus a network with 0.1% packet loss over time will sound a lot different to one that encounters a burst loss or 3 or more packets, but still at 0.1% loss

3.2.5 Available Bandwidth

If a connection is rated at a particular bandwidth, this does not necessarily mean that all of this bandwidth is available. Connections between LAN and WAN network devices include a certain amount of overhead for inter-device traffic including inter-device and general broadcast traffic. A collision in a shared network and guard time between packets also reduces the available time in which data can be sent. This is a result of the fact that the data is asynchronous to the connection. In the TDM world this is taken care of through strategies such as framing and clock synchronisation. So, the available bandwidth is always less than the connection bandwidth.

3.2.6 Packet Priority Mechanisms

In a network oriented towards data devices, absolute delay is not too important, but accuracy is. For voice traffic, a certain amount of incorrect, or lost information, can be accepted, *but* information delivered in an untimely manner cannot be accepted. The issue is therefore to ensure that any voice traffic gets 'pushed' to the front of any connection queue. If PC type data is delayed a fraction this is less important. There are two similar mechanisms at work to help with priority. At Layer 2, IEEE802.1p/Q can be invoked; at Layer 3 Diffserve (formerly Type of Service) can be used.

3.2.7 WAN Connections

Best Quality of Service is obtained when the customer has control of the external WAN connections. This can be achieved by using dedicated leased lines between sites, or alternatively by ensuring a guaranteed Service Level Agreement (SLA) from the external network provider.

When specifying a SLA it is important that the guaranteed Committed Information Rate (or similar) is specified and this should also include a guard band. Data sent in excess of the CIR is likely to be discarded during congestion periods in order to maintain guarantees on the SLA. It may therefore also be advantageous to split Voice traffic from normal data traffic with different SLA.

For more dedicated links some additional protocols can be used to improve bandwidth usage. The data in an Ethernet LAN connection includes a data layer for Ethernet and also for the IP layer. In a WAN connection, this Ethernet layer is not needed. However, other layers are needed in order to transport the IP layer (and voice data). As a result of this, certain WAN protocols can give bandwidth advantage, i.e. use less. These include the more dedicated links such as PPP and Compressed PPP.

3.2.8 Transcoding and Compression

Transcoding is seen as the changing of voice information sent with one CODEC type into that from a different CODEC. However, most CODEC devices rely on G.711 as the base entry level. Thus, transcoding could be seen as going from G.729 to G.726, but this is likely to be via G.711. Compression is seen as simply reducing the amount of data, and in the voice world this could be achieved by going from G.711 to G.729, for example. The terms are often used interchangeably.

Any form of voice compression works by removing a certain amount of information which it deems to be non-essential. This may include not sending data during silence periods as well as sending only the main frequency elements of the voice rather than the full bandwidth. The result of this is that some information will always be lost. Compressed voice will therefore never be as good as uncompressed voice, but the main requirement is to carry the intelligibility. Of the compression CODECs seen, G.729 has good bandwidth reduction as well as maintaining a good voice quality and intelligibility.

In the LAN environment where bandwidth is 'plentiful' there is probably little reason to compress voice, and so G.711 will normally be the CODEC of choice. In a WAN environment, where access bandwidth may be limited, use of the G.729 CODEC could increase the amount of voice traffic that can be carried on a particular link. There may be instances where G.711 is still preferred, for voice quality, but this will limit the voice traffic of the link.

3.2.9 Hubs Versus Switched

The best network configuration is to be entirely switched. This allows full network bandwidth to be made available to the end user and greatly reduce collisions with a resulting network utilisation decrease, i.e. making more bandwidth available for another application, such as voice!

A Hub works by sharing bandwidth between a number of devices. They 'fight' each other for access. The devices that fail to get access need to wait for an available slot. Hubs also don't implement any form of QoS control. Where data needs to be sent in a timely manner, there is a high probability of introducing unnecessary jitter with potential packet loss.

In a switched environment, all ports can pass data to a LAN switch. Data is passed to queues and priority can be given to types of data, such as those marked by IEEE8021.p/Q tags. Where two devices share a common LAN switch they can effectively pass data to each other at high speed as though they were the only devices on the network, whilst other devices could equally be doing the same. Use of a switch is almost the same as having multiple networks. Network efficiency is greatly improved, as well as network management.

Since connections in a switched network are typically point to point, there is also the possibility of configuring the connection to be **Full Duplex**. This virtually doubles the bandwidth, since data can be sent and received at the same time. In a half duplex environment data can only be sent or received sequentially. Equipment configured with 'auto-negotiation' will always determine the highest possible data rate and make that available on a connection by connection basis. Simple hubs are generally 'bottom of the shop', fixed at 10BaseT half duplex.

3.2.10 LAN Architecture

Networks usually consist of different layers. The two main parts are the 'core' network and the 'access' network.

The 'core' network will potentially have data on dedicated links at 1Gbits/s or even higher. The switches at this level will probably include some Layer2 and Layer3 switching and will agglomerate a number of sub-nets onto one, or a small number of units. These units will almost certainly have UPS backup and will be cross-connected in redundant configurations, such that failure of one device is unlikely to result in total network failure.

The 'access' network connects to the core units by single or multiple connections. It provides the slower 10/100BaseT type of connections to the user. These may be cross-connected within geographic locations. If a device fails here, then only the locally connected devices will fail. These units may or may not have UPS backup. This should be considered when voice devices are connected to these access devices.

Ideally the VOIP controller should have a connection higher up in the network, located more towards the core than at an access point.

Maintaining Voice Quality of Service

A number of areas affect voice quality of service. In the IP world these are primarily:

- End to End Delay
- Jitter, or delay variation
- Packet Loss
  - Due to link congestion resulting in discarded or out of sequence packets
  - Due to forced loss of packet due to excessive jitter

3.3 Network Measurement Criteria

Assuming that jitter and packet loss are taken care of, the one parameter left that affects the voice and conversation quality is end-to-end delay. From ITU-T recommendations (and practical experience) the end-to-end delay for a voice call should not exceed 150ms. The characteristics of the end devices such as the gateway (Ethernet and TDM bridge in the contoller) and the IP-Phones are known.

So, in assessing a network the following network limits should be considered:

Packet Loss	Jitter	End-to-End Delay	Ping' Delay	
<1%	<30ms	<50ms	<100ms	Green - Go!
<5%	<60ms	<80ms	<160ms	Amber - Caution
>5%	>60ms	>80ms	>160ms	Red - STOP!

'Ping' delay is the value obtained from using a PC 'Ping' utility. Typically in a network, equal delays are seen on the send and receive paths. Jitter can be estimated from using 'Ping' over a short and longer-term period. Packet loss can be estimated by using 'Ping' over a longer period. Longer means a number of hours such as 24 hours plus.

Other tools, such as network analysers can also be used to determine packet loss. Many now look for VoIP and RTP packets, and can identify when a packet is missing as well as average jitter.

3.4 Bandwidth Requirements

An IP-Phone is capable of providing a number of CODEC types. These currently include:

- G.711 : Same as TDM, both A-Law and u-Law
- G.729a

Typically the G.711 CODEC provides the best voice quality and is comparable to TDM type connections. G.729a provides a good reduction in bandwidth with only minor loss in voice quality. Typically G.711 would be used where bandwidth is available, such as in a LAN environment, whereas G.729a would be used in a WAN access environment, where bandwidth is not so readily available.

The table, below, shows typical **wire data rates** for different protocols and LAN/WAN interfaces. Note, for example, that a Half-Duplex link uses twice the bandwidth on the connection than a similar Full Duplex connection for the same voice connections. This is because the Half-Duplex connection is shared with other devices and one transmitter must also send data on the receive path for all other devices to hear.

From the statement some recommendations ensue:

- Use Full Duplex wherever possible. This requires point to point connections
- Use a switched environment, rather than hubs

Data Type	LAN Usage at 10Mbits/s	IP Data Payload	Voice Data Rate (End toEnd)	Voice streaming at physical connection
IP Phone (G.711) Signalling	Burst 0.2%	80kbit		
G.711 IP Phone 20ms (LAN - Half Duplex)	2%	80kbits/s	64kbits/s	193.6kbits/s
G.711 IP Phone 20ms (LAN - Full Duplex)	1%	80kbits/s	64kbits/s	96.8kbits/s
G.729 IP Phone 20ms (LAN - Half Duplex)	0.8%	24Kbits/s	8kbits/s	81.6kbits/s
G.729 IP Phone 20ms (LAN - Full Duplex)	0.4%	24Kbits/s	8kbits/s	40.8kbits/s
G.711 IP Phone 20ms (WAN - IP over FR)	Dependent upon WAN link rate	80kbits/s	64kbits/s	94kbits/s
G.729 IP Phone 20ms (WAN - IP over FR)	Dependent upon WAN link rate	24kbits/s	8kbits/s	38kbits/s
G.711 IP Phone 20ms (WAN - PPP)	Dependent upon WAN link rate	80kbits/s	64kbits/s	84kbits/s
G.729 IP Phone 20ms (WAN - PPP)	Dependent upon WAN link rate	24kbits/s	8kbits/s	28kbits/s
G.711 IP Phone 20ms (WAN - Compressed PPP)	Dependent upon WAN link rate	65.2kbits/s	64kbits/s	68kbits/s
G.729 IP Phone 20ms (WAN - Compressed PPP)	Dependent upon WAN link rate	9.2kbits/s	8kbits/s	12kbits/s

As we can see from the table the physical 'wire' bandwidth required by the IP-Phone is typically:

- **G.711**: about **100kbits/s**
- **G.729**: about **40kbits/s**

- What is wire bandwidth? This is what you pay for.
- How is this different from IP (data payload) bandwidth? IP is a number of layers removed from the real connection. It encapsulates the data with routing and address information. It is the *basis* on which other protocols are then added, such as Frame Relay or Ethernet, to get the data physically moved around, i.e. each of these protocols adds its own overhead on top of the fixed IP bandwidth. See section 3.8 Network Priority for more detail on the frame breakdown for Ethernet. Compare IP bandwidth in the table above with the real wire bandwidth requirements.

3.5 CODEC selection

The selection of the CODEC to use on a particular connection can be dependent upon a number of issues, including:

- Voice Quality expected by the user
- Available bandwidth, especially on a WAN link
- Number of devices on a link, and how many are active based on traffic, see section 4.2 below

The voice quality of the CODECs available is usually expressed in terms of a Mean Opinion Score (MOS). The scores range in value from 0 to 5. Typically, anything above 4 is considered as acceptable speech quality. Some typical MOS scores for the CODECs is shown in the table below:

CODEC Type	MOS	LAN Bandwidth
G.711	4.3	~100kbits/s
G.729	4.0	~40kbits/s

As can be seen the G.711 CODEC gives the better speech quality, but also requires more bandwidth in order to achieve this. For this reason it may be desirable to use the G.711 CODEC in a LAN environment, but switch to G.729 in a WAN access connection. In the VOIP Call Processing Controller the switch of CODEC can be configured through 'Compression Zones' under 'IP-Trunking'.

3.6 Available Bandwidth

When a link is advertised at a particular rate, this is the 'speed' at which the data travels. It is not necessarily the available data rate. In practice, a percentage of this bandwidth is lost due to communication between end devices and because the data is asynchronous and requires certain guard bands. In a synchronous telecom link these issues are taken care of through mechanisms such as framing data into fixed time-slots.

This results in some simple guidelines for LAN and WAN links:

Data Connection Type	Percentage of Bandwidth Available	Example
LAN – 10BaseT Half Duplex	40%	10Mbits/s => 4Mbits/s available
LAN – 10BaseT Full Duplex	80%	10Mbits/s => 8Mbits/s available
LAN – 100BaseT Half Duplex	40%	100Mbits/s => 40Mbits/s available
LAN – 100BaseT Full Duplex	80%	100Mbits/s => 80Mbits/s available
WAN – 1.5Mbits/s Frame Relay without QoS mechanism in Router	40%	1.5Mbits/s => 600kbits/s available
WAN – 1.5Mbits/s Frame Relay with QoS mechanim in Router	70%	1.5Mbits/s => 1.05Mbits/s available

3.6.1 LAN

This also leads to some simple guidelines for LAN connections (assuming that all the available bandwidth is used for voice traffic only):

Cable Capacity	Bandwidth %	Phone Usage at G.711	"Voice Channels" G.711	"Voice Channels" G.729 (x 2.5)
10BaseT Half	40%	2%	20	50
10BaseT Full	80%	1%	80	200
100BaseT Half	40%	0.2%	200	500
100BaseT Full	80%	0.1%	800	2000

This is the maximum capability of a LAN link assuming that the link is used purely for voice traffic. If the link is shared with other devices, such as PCs, then some priority mechanism will be needed to ensure that the voice gets the available bandwidth when needed. Also, in a busy network with multiple broadcasts the available bandwidth will reduce by this percentage. For example, in a network with 10% broadcast traffic (at 10Mbits/s) the 40% available bandwidth will reduce to 30% for a half-duplex link, and the number of 'voice channels' accordingly.

Why is the ratio from half-duplex to full duplex four and not two? Well conversations need both a talk and a listen path. And, for half duplex both paths share the same physical wire, whereas for full duplex both send and receive can occur simultaneously on different wire pairs.

Thus for half-duplex the channel availability is 10M x 40% / (2 x 100k) = 20 channels. Only 40% of the bandwidth is available due to collisions and the collision avoidance mechanisms. For full duplex connections there are no collisions, so utilisation can double to 80%. Also there are separate paths for send and receive data, so only half the connection bandwidth is used. Thus 10M x 80% / (1 x100k) = 80 channels.

3.6.2 WAN

A WAN link is generally point to point between routers and so is always a full duplex link. The link speed for access WAN connections are also slower, so the number of available 'voice channels' is reduced.

So, for example a 1.5Mbits/s link might support the following number of 'voice channels':

Cable Capacity	Bandwidth %	"Voice Channels" G.711	"Voice Channels" G.729 (x 2.5)
1.5Mbits/s without QoS mechanism	40%	6	15

1.5Mbits/s with QoS mechanism	70%	10	26

When a WAN link is shared with other data devices there are other considerations including the introduction of waiting delay. The end device sees this as jitter resulting in potential packet loss and the user experiencing voice quality degradation. All these need to be considered.

3.7 Serialisation Delay

Serialisation delay is due to the fact that data is queued in a particular device, but cannot be sent because another packet is currently being sent. In a fast link, such as in the LAN, this delay is fairly small (orders of a few milliseconds) and is easily taken care of with the end-device jitter buffer.

However, in a WAN access connection, the data rate is potentially not as high as within the LAN. In this case the waiting delay increases as the data rate reduces. If a particularly large packet (1500 bytes) is being sent, then other devices must wait until that has gone before they can get access.

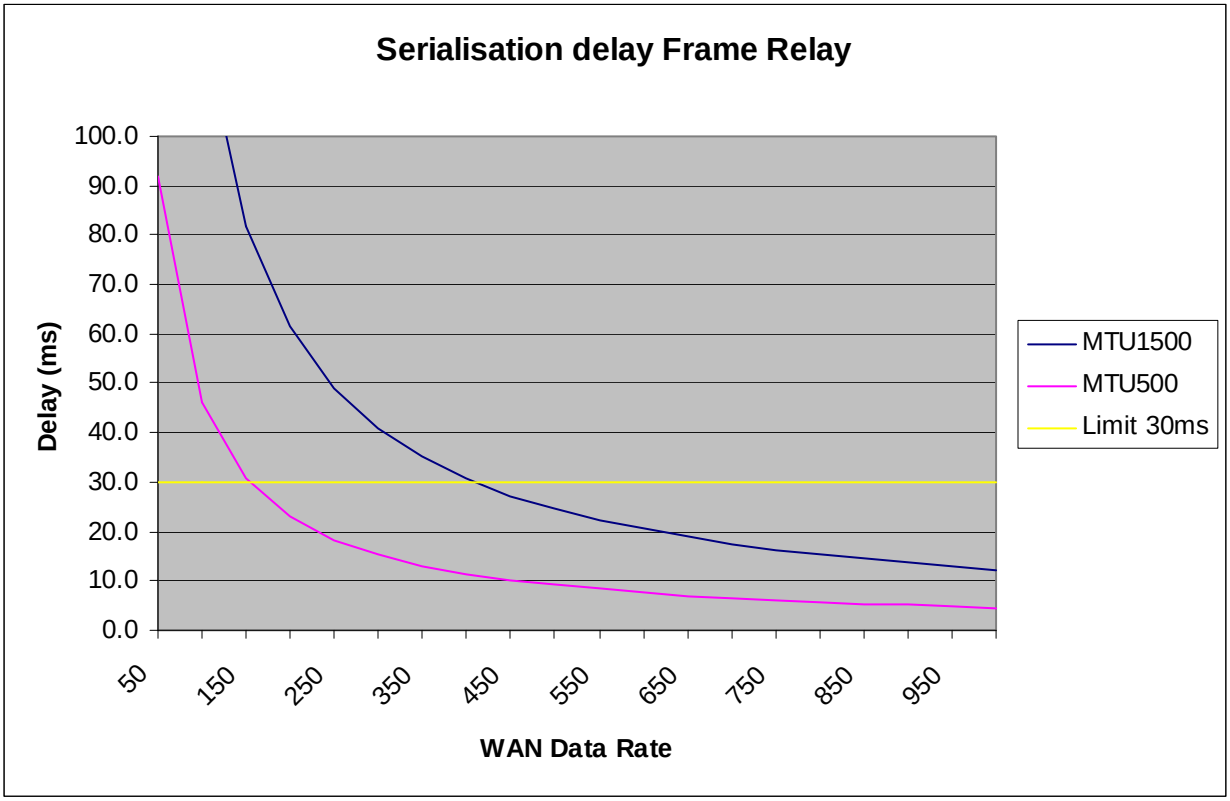
The IP-Phone and gateway devices are capable of handling delay variations up to 30ms, but this is the limit. A more reasonable working limit is 20ms. The following chart shows waiting delay against link speed as well as against MTU.

From the graph, below, it can be seen that when a packet of 1500 bytes is sent, in order to meet the 20ms ideal working position, that a data-rate of about 700kbits/s is needed.

Through modifying the router MTU value to 500, larger packets will be cut down and sent in smaller chunks. The result of this is that there are three times as many opportunities to send the voice data. Thus the data rate link could be reduced to 300kbits/s.

Beware, as some packets may not allow MTU to cut them down. Video may be one of these. In this case the router with the lower MTU could reject these packets, effectively denying access.

Although the data rates above are minimum recommendations, slower speeds have been used. However, these involve links with strict control of priority queuing and may involve physical restrictions such as available for PC ***or*** Phone but not both simultaneously.



For slower speed links then the recommendation is to **reduce the MTU** in the routers/gateways to provide more opportunity for the voice traffic. A value of 500 has been found to work well.

3.8 Network Priority

There are two areas where priority mechanisms operate in the network to ensure that voice traffic maintains high priority. These are:

- Layer 2 in the LAN through use of IEEE802.1p/Q
- Layer 3 in the WAN through use of DiffServe/TOS/Precedence

The picture blow highlights an Ethernet packet format, and the location of the Layer 2 Priority and Layer 3 Priority fields. This view is of a Tagged frame, since it included IEEE802.1p/Q information.

								Bits	Bytes			
MAC Container												
					MAC Preamble				7	IEEE 802.3		
					MAC Start of Frame De-limiter				1			
					Destination MAC				6			
					Source MAC				6			
Quality of Service - Priority Layer2					Qtag Prefix				4			
					Frame Type				2			
	IP Container								20	RFC791		
					Version			4 bits				
					IHL			4 bits				
	QoS - Priority Layer 3				Type of Service			8 bits				
					Total Length			16 bits				
					Identification			16 bits				
					Flags			3 bits				
					Fragment Offset			13 bits				
					Time to Live			8 bits				
					Protocol			8 bits				
					Header Checksum			16 bits				
					Source Address			32 bits				
					Destination Address			32 bits				
		UDP Container							8	RFC768		
					Source Port			16 bits				
					Destination Port			16 bits			IP	Ethernet
					Length			16 bits				
					Checksum			16 bits				
			RTP Container						12	RFC1889		
					V=2			2 bits				
					P			1 bit				
					X			1 bit				
					CC			4 bits				
					M			1 bit				
					PT			7 bits				
					sequence number			16 bits				
					timestamp			32 bits				
					synchronization source (SSRC)			32 bits				
				Voice Payload					160	Voice Payload		
					Frame CRC				4			
					Inter-Packet Gap				12			
							Total Bytes		242	200		

3.8.1 LAN Layer 2 Priority

The priority mechanism used relies on that described in IEEE802.1p. This is a sub-section of IEEE802.1Q also known as VLAN tagging.

One potential issue is the different ways in which these specifications have been interpreted. There are a number of switches appearing on the market that provide VLAN capability, but these may not use all of the sections specified in 802.1Q. The method of configuring the switch ports may also differ.

The main requirements are thus:

- Ports should be configurable to provide VLAN tagging to incoming untagged information and remove this tagging when passing out of the switch. This is used by the controller and associated applications
- Ports should be configurable to pass all active VLANs with tagging from one switch to another; i.e. there is no untagged information present in the connection. This is used between LAN switches and maintains priority information between units.
- Ports should be configurable to accept untagged information, pass this on to a specified VLAN, as well as accepting tagged information. The port should also strip off tagging for data from a specific VLAN, but not strip data from other VLANs. This is used when connecting the dual port phones and PCs to the network.

Some other VLAN guidelines for use with voice include:

- Additional bandwidth is always good!
- Use full duplex wherever possible
- Don't use VLAN 0
- Set Priority to value 6 for voice
- Set Priority for untagged VLAN/native VLAN/default_vlan to 0
- Hubs don't support priority queuing, so use Layer2 switches with 802.1p/Q support

3.8.1.1 Cisco Port Examples

This is data collected from the command line interface (RS232 connection)

3.8.1.1.1 Dual Mode / Trunk

This mode allows untagged information to be placed onto a specific VLAN as well as passing VLAN tagged data for other VLAN. Typically this configuration would be used to connect to a dual port phone with an attached PC (no VLAN).

```
>switchport trunk encapsulation dot1q
>switchport trunk native vlan 193
>switchport mode trunk
>spanning-tree portfast
```

1. This configuration is for the dual port phones. It can be seen that the port will provide VLAN tagging through the first command line, and that the encapsulation type is to IEEE802.1Q (dot1q). Cisco also supports a similar scheme of priority with ISL encapsulation, but this is proprietary so will not inter-work with other vendor equipment.
2. The port is configured such that untagged information will be directed to (native) VLAN193.
3. The port is considered as a trunk due to the fact that it handles multiple VLAN connections.
4. The last command indicates that this port will not be closed down during spanning tree operations. It is left to the network engineer to ensure that there are no network loops behind this connection. (This command would typically be used when connection is to a server or the main controller).

3.8.1.1.2 Access Port / Non-VLAN aware device

This interface will not accept VLAN tagged information, but will add tagging information to data between the access port and VLAN712 (in this case the voice VLAN). This would be used for the VOIP Call Processing Controller, or for an application such as Speak at Ease.

```
>interface FastEthernet0/19
>switchport access vlan 712
>spanning-tree portfast
```

Other commands will allow the individual port priority to be specified. In the case of the access port, the 'encapsulation' method is specified elsewhere.

Whilst, the IEEE specification allows for VLANs from 0 to 4095 not all vendors support this range. As a general rule VLAN 0 is treated in different ways by different vendors. The recommendation is **not** to use VLAN0. Cisco also reserves VLAN 1000 upwards for its own purposes, so these are also not recommended for use.

3.8.1.1.3 Multi-VLAN Port

Cisco devices provide this as another port configuration. However on some of the devices it is not possible to use this and 'Trunk' ports on the same unit. Unfortunately, the multi-VLAN port type is needed in order to work with other vendor products. A 'Trunk' port can be used, but it will also remove tagging from the configured native VLAN, which may not be what is required. There are two possible ways out of this situation:

- Run ISL between the two units, but then they both need to be Cisco
- Create a dummy VLAN that is not used anywhere else in the network. This will ensure compatibility with other vendor units and allow products to be mixed.

3.8.1.2 HP Port Examples

The HP switch uses a similar RS232 connection, but the user interface is more menu-driven. This makes the configuration much more intuitive. A typical screen display is shown:

```
Actions->  Back    Add    Edit    Delete    Help
Port   DEFAULT_VLAN  voice_vlan   data_vlan    test4
----- + ------------ ------------ ------------ ------------
  1   | Untagged     Tagged       No           No
  2   | Untagged     Tagged       No           No
  3   | Untagged     Tagged       No           No
  4   | Untagged     Tagged       No           No
  5   | Tagged       Tagged       Tagged       No
  6   | No           No           No           Untagged
  7   | No           Untagged     No           No
  8   | Untagged     No           No           No
  9   | Untagged     No           No           No
  10  | Untagged     No           No           No
  11  | Untagged     No           No           No
  12  | Untagged     No           No           No
```

The default_vlan is VLAN1. The VLAN numbers have been assigned names to help follow which function is assigned to which VLAN. The 'voice_vlan' is VLAN2, the 'data_vlan' is VLAN3 and 'test4' is VLAN4.

The IP devices that would be connected to the port examples above would be:

- Ports 1 to 4: Dual port phones with PCs.

- Port 5: Interconnect between network switches.
- Port 7: VOIP Call Processing Controller, or similar voice applications such a Speak at Ease.
- Ports 8 to 12: Connect only to PCs.

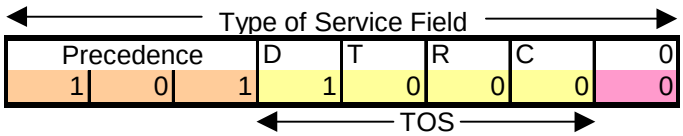
In common with many switch vendors it is *not recommended* to use VLAN0 with HP. However it is possible to extend the VLAN numbering up to the maximum of 4095.

3.8.2 WAN Layer 3 Priority

There are a number of different WAN technologies to provide data routing with different priorities and service level agreements. Most of these deal with the WAN technology, but most rely on information being presented in the Layer 3 Type of Service field.

The Type of Service field has undergone some name changes as well as additional functions. This field is now also covered as DiffServe, or Differentiated Services. The DiffServe uses the precedence and some of the TOS bits (TOS instead of Type of Service field) to provide 64 different services. See the diagram in section 3.8 above to find the location of Type of Service field.

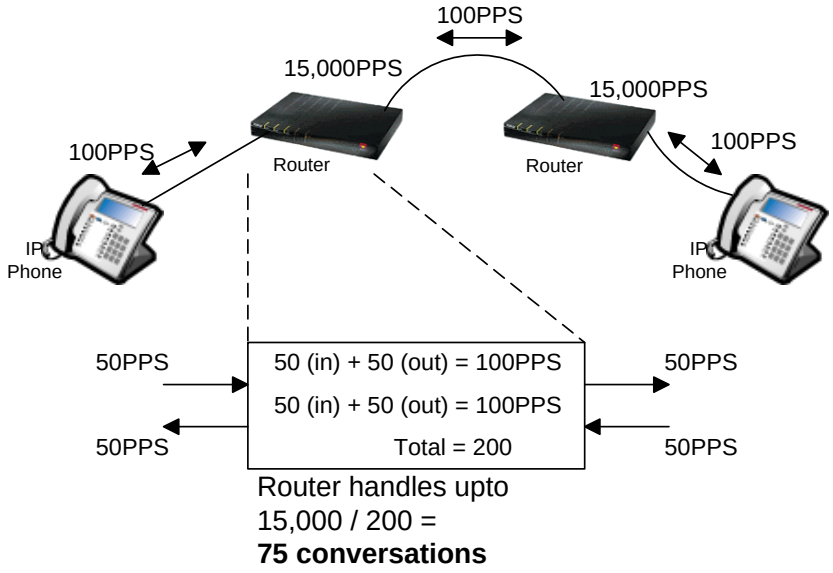
The VOIP Call Processing Controller and IP-Phones use the Type of Service format for priority and TOS. This complies with RFC791, but also by choice of value, RFC1122 and RFC1349.



The precedence field is similar in operation to the IEEE802.1p field, and in fact many routers offer the capability of mapping between the two schemes. Once a TOS and precedence is chosen it never changes. Therefore the voice application sets the appropriate values before data is sent. Voice applications are fixed with a value of 0xB0 for the Type of Service field. This provides a precedence of 5 with minimum delay.

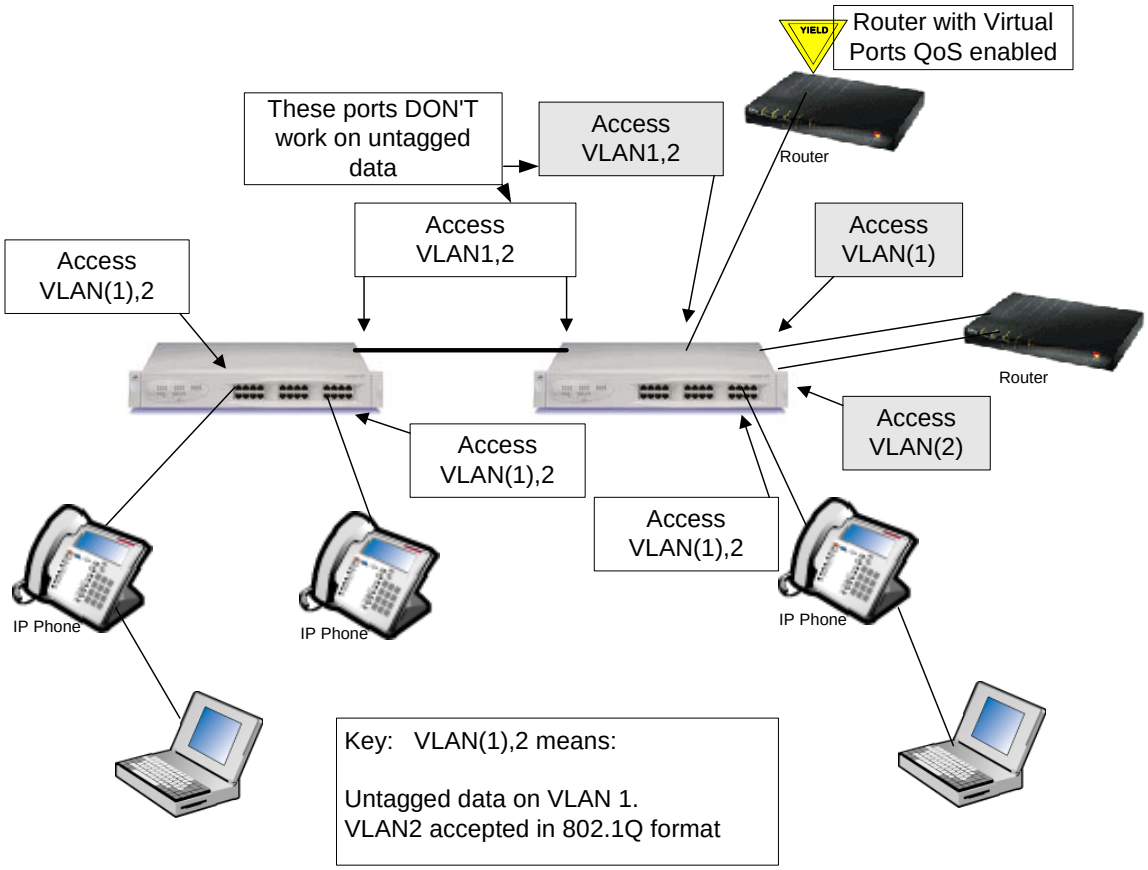
All that is required is that the router device support priority queuing mechanisms, such as Weighted Fair Queuing.

With a Layer 3 device, such as a router, the packet per second (PPS) **throughput** is also important. With an IP-Phone the frame rate is every 20ms. This means that the phone will send 50 packets per second and will also receive 50 packets per second. Beware though how vendors might specify the PPS rating. For example, with two phones connected to a router each port will send and receive 50PPS. That's 100PPS per port, requiring that 200PPS to be *handled*. However, between the phones only 50PPS went one way and 50PPS in the return direction. So, *throughput* was 100PPS.
In this diagram the Router has a handling capacity of 15,000PPS. Throughput would be half this number.



3.8.3 Network Topology with Priority

The following network diagram highlights the use of the Dual Port Phones and the configuration of a network including VLAN priority and also the use of Diffserve/TOS in the WAN connection.



In the diagram, the network switch ports connected to the Dual Port Phones must be able to accept both untagged information *and* tagged information. The untagged data will then be translated to a 'data' VLAN (1), whereas the voice will be destined for a Voice VLAN (2). In the outgoing direction, these ports must also pass information from the Voice VLAN still tagged, *but* traffic from the 'data' VLAN must be sent untagged for the devices that are incapable of handling VLAN information.

The requirement to use VLAN and priority queuing becomes obvious when both 'data' and Voice information must share a link between units within the network. In this case it is important that the deterministic voice information gets priority over the non-deterministic 'data' traffic. This is where the IEEE802.1p comes into play, and IEEE802.1p is a subset within IEEE802.1Q.

Routers, or Layer3 switches, involved in segmenting the network will also need connections into the different VLANs. Each VLAN will be identified by a VLAN number, but also by the unique sub-net address. In this way the routers and Layer3 switches that are unaware of VLAN can still pass data between the VLANs. In this case it is required that a separate physical connection be made to each VLAN, and that the ports on the Layer2 switch only pass information to and from one specific VLAN. At the Layer2 port, the VLAN information is removed on egress and added on ingress according to the port or VLAN configurations.

Some routers are VLAN aware. These can be considered to include a virtual Layer2 switch within the unit, which then directs data according to the VLAN information. These devices are often referred to as including 'Virtual Ports'. The advantage is that only one physical connection is needed to handle multiple VLANs.

3.8.4 Use of Subnets

Generally this is a good thing to do, irrespective of whether a voice over IP installation is being used.

Creating a flat network may appear to speed up transactions due to the high link speed, but Layer3 switches are very much hardware oriented today, and give equally good performance as their Layer2 counterparts.

Remember that in the Layer2 switch environment, data can be addressed directly to a specific port hence reducing loading on links not used. However, where the Layer2 devices are unable to identify an address, or port location to use, additional protocols are needed to get this information. These additional protocols generally broadcast data to every port and device. In this instance, the loading on the network is almost back to that of a shared environment. The Layer 2 devices maintain a list of addresses and port location in internal memory. If the list is small, then the level of broadcasts can also increase since new information is rapidly 'aged' out of the list.

Hence a large flat network can potentially grind to halt, not because of genuine traffic loading, but simply due to the amount of broadcast traffic that will be needed. Using subnets helps by segmenting broadcast domains. The Layer2 devices subsequently need to hold less information, and so broadcast less often.

Therefore including Layer3 devices will improve speed within communities of interest and the overall network, as well as reducing the burden on the system to all the broadcast traffic. It is also a requirement for VLANs to operate correctly and provide the voice priority that is required when using Dual Port Phones.

4. Maintaining Availability of Connections

This area could be considered as the signalling quality of service. It is a measure of how long a user needs to wait before a service becomes available, or whether the user becomes blocked from using a function. Examples of this would be delay in receiving dial tone, or blocking that could occur if there are insufficient PSTN trunks.

4.1 System Capabilities

As the system grows, and more traffic is presented, it has to deal with an ever-increasing number of tasks. The end result of this is that feature interaction becomes slower. The ICP systems are engineered to ensure that with different combinations of devices services are still maintained within normal working parameters. The exact details are not captured here, but are specific to particular releases, since changes in software or hardware have a bearing on the results.

In terms of calculating some of these limitations a good guideline has been to use the PI numbers from SX2000 and add 10% overhead for IP devices.

4.2 Traffic

The largest effect on performance and availability is the level of traffic that the units need to handle. There are a number of areas that are affected by traffic. These include:

- Trunks to PSTN
- E2T (Gateway) channels
- DSP channels
- LAN blocking between devices
- WAN blocking between end points

The traffic guidelines used in calculating the system performance are based on:

- Standard busy office traffic : 6CCS (about 6 calls per hour)
- ACD : 27CCS (about 27 calls per hour)
- 36CCS = 1 erlang = 3600 call seconds during the busy hour.
- Traffic is split roughly 65% to and from trunks, with the remainder internal or intercom traffic.
- Traffic blocking is calculated using **ErlangB** formula
- Traffic blocking probability for **internal/intercom** traffic is **P.001** (1 in 1000 calls blocked)
- Traffic blocking probability for **trunk** traffic is **P.01** (1 in 100 calls blocked)

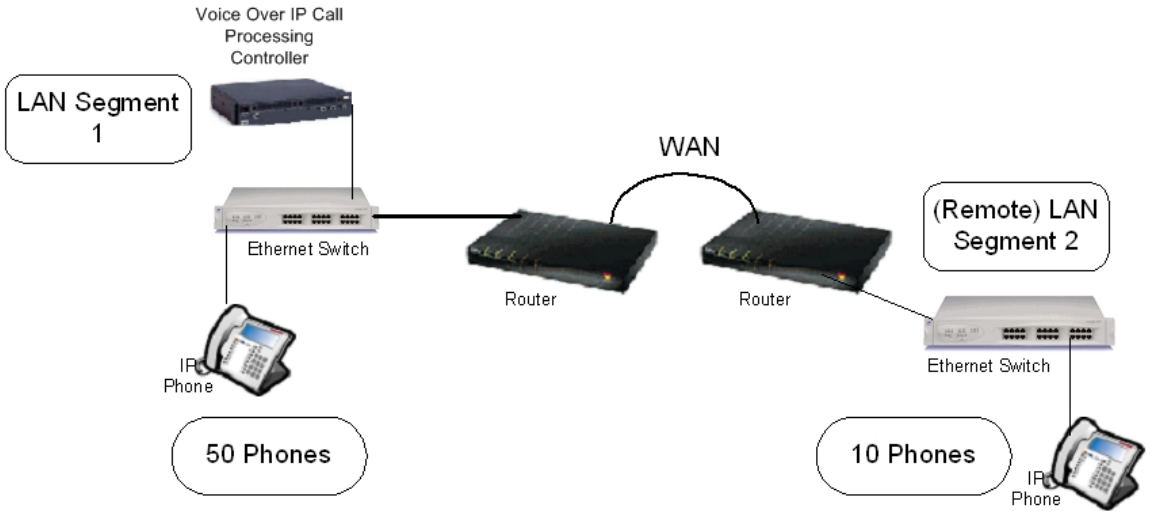
For TDM traffic it is possible to calculate the amount of traffic that needs to be presented in terms of CCS and match this to a number of trunk channels. In the IP world fixed channels do not exist, so this calculation becomes a little trickier.

In calculating the amount of traffic that can be handled over a LAN or WAN link, the bandwidth calculations in section 3.6 Available Bandwidth can be applied. From these it is possible to work out a number of 'voice channels' and hence assign a particular CCS rating.

4.2.1 WAN traffic worked example

In this example we will assume the following configuration:

- There are 50 IP Phones at the corporate centre
- There are 10 IP phones over a T1 link at a remote site
- Trunk traffic is 65% of all traffic
- Traffic between remotely located IP phones stays local to the remote site, i.e. it does does not traverse the WAN link



Calculation	Formula	Result
Remote Phones		10
Total CCS at remote site	Remote phones x 6CCS	60CCS
Percentage trunk traffic	Total CCS x 65%	39CCS
Percentage intercom traffic	Total CCS x (100 – trunk traffic)%	21CCS
Local Intercom Traffic	Intercom traffic x Ratio of local phones / total phones (21 x 10 / 60)	3.5CCS
Total traffic over WAN	Total traffic – local traffic	**56.5CCS**

Thus:

- The total traffic handled is 60CCS.
- 3.5CCS is local traffic
- WAN traffic is therefore: **56.5CCS** = 60 –3.5

From an earlier calculation it was highlighted that a T1 WAN link could handle 6 G.711 'voice channels'. From ErlangB tables with P.001 blocking such a link can handle 41.1CCS. There is therefore a mismatch between presented traffic and carrying capacity.

Solutions that come from this can then be covered by:

- Use compression (G.729) to the remote phones. This increases the 'voice channel' capability. However it also reduces voice quality, which may not be acceptable.
- The WAN link bandwidth could be increased
- The blocking ratio could be changed to P.01, such a link would handle 68.8CCS
- The number of remote phones could be reduced, or the overall number of phones could be reduced.

These are all potential solutions and each may have to be investigated to understand the nature of the installation. Doing this calculation up front ensures that such issues are highlighted ***before*** equipment is bought and installed.

4.3 IP Trunking limits

The IP-Trunking is a form of networking that allows traffic from different controllers to be passed between them. This provides the ability to build larger systems, as well as combining systems in different geographic locations as a single system.

Where LAN/WAN connections exist between nodes, then this medium can be used to pass traffic. A limit on the number of conversations is set on this connection. In the event this limit is exceeded, an alternative path will be tried, be it via a different node connected via IP, or alternatively through the PSTN TDM network.

The issue is what trunk restriction value to set for a particular connection. This relies very much on traffic and also the bandwidth calculations, such as those carried out in earlier sections.

Since the bandwidth is derived from the number of conversations it is important to understand which CODEC will be used across the link. Is it exclusively G.729, or G.711 or a combination of both?

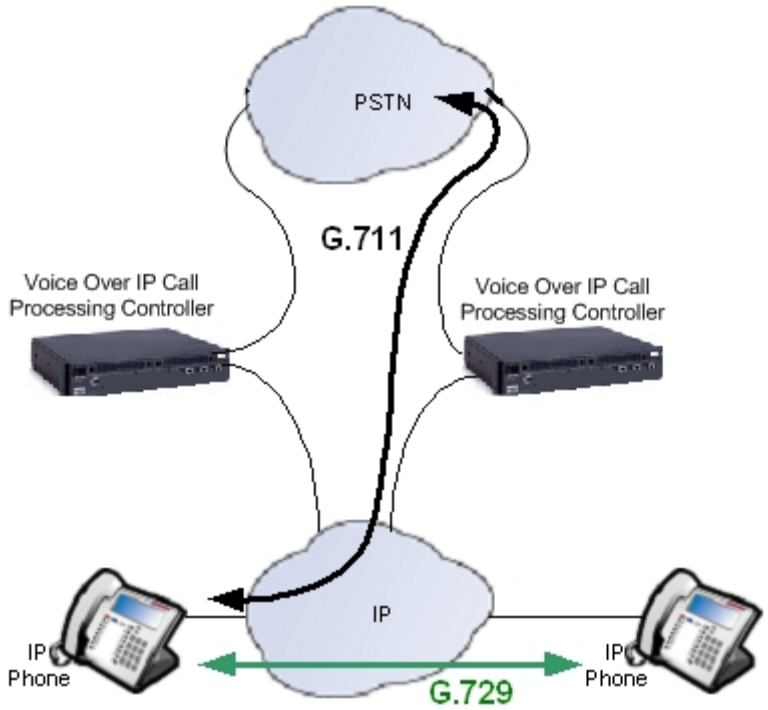
Also, the level of networking between nodes needs to be understood and whether this includes PSTN trunk traffic or only internal intercom traffic.

As a general guideline we can consider that a single node might have a high networking traffic ratio of 15%. For a particular node with a number of devices, the amount of traffic to and from this node will remain essentially constant. What will differ, will be the level of traffic destined for another particular node. For example, 15% of traffic might be destined for the second node in a two-node system, but 7.5% will be destined for each the other two nodes in a three-node system. Obviously in the second scenario less bandwidth will be needed per to and from a particular node, but the total per node will remain about the same.

4.3.1 IP Trunk Limit working example

Consider the following example:

- Two equal sized systems
- Exclusively 250 IP devices/phones
- Calls from TDM, or to TDM devices including trunks, use G.711 CODEC
- Calls between IP devices use the G.729 CODEC
- Traffic is typically 35% (100-65) internal, the remainder to and from PSTN trunks
- Calls internally are typically 50% outgoing and 50% incoming
- Traffic is rated at 6CCS per device
- Traffic between nodes is 15%



IP Trunking

Doing some simple calculations below:

Calculation	Formula	Result
Traffic from IP sets	Number of sets (250) x 6CCS	1500CCS
Percentage networked	Total traffic x 15%	225CCS
Percentage traffic intercom	Networked traffic x 35%	79CCS
Percentage traffic trunk to PSTN	Networked traffic – intercom traffic	146CCS
Total Number of IP Trunk channels needed	ErlangB on total IP trunk traffic (225CCS)	13 Channels (P.01)
Number of channels needed for PSTN Trunks (G.711)	ErlangB on PSTN trunk traffic (146CCS)	10 Channels *1 (P.01)
Number of channels needed for Intercom/Internal traffic (G.729)	ErlangB on Intercom traffic (79CCS)	7 Channels *1 (P.01)
Bandwidth needed (use worse case)	Number of G.711 channels (10) x 100k + [Total number of channels (13) – PSTN trunk channels(10)] x 40k	1120kbits/s
WAN Bandwidth Required	Assume with QoS so / 70%	**1600kbits/s**
Number of channels for IP Trunk	Total number of channels	**13 Channels**

*1 Note: The number of channels needed purely for internal traffic is 7. For external traffic the total number is 10. However, together the total is only 13. How is this so? The reason is that a number of channels will have shared use, in this case it must be 4 (10+7-13). The higher G.711 rate is used to ensure adequate bandwidth at all times.

Thus it can be seen that this data rate is pretty close to a typical T1 rate. The option could be to increase the available link rate by upgrading to an E1 link, or multiple T1 links, or accept a lower quantity of IP Trunk calls, i.e. slight reduction in inter-node traffic

5. Getting Started

The above two sections have dealt with network conditions and call traffic. However, before any of this can occur, the system needs to be installed and the end devices need some code to get them running.

5.1 Start-up sequence for phones:

This is the normal sequence of events for a dual port IP Phone, where VLANs are implemented:

- Power up
- Run 'Boot' code
- Request IP address (untagged) through DHCP
- Receive IP address from default VLAN (data VLAN) and specific phone and system options
- Check VLAN information
- Relinquish IP address (untagged)
- Request IP address on voice VLAN (tagged)
- Receive IP address from voice VLAN and specific phone and system options again
- Check VLAN information matches, if not repeat until it is.
- Locate TFTP server
- Get running code
- Register with call control
- Go!

The phone does a double fetch of information, so it is important to have the same VLAN and priority information in the DHCP server associated with the data VLAN as it is for the DHCP server associated with the voice VLAN, i.e. copy the option data.

The engineering guideline that can be highlighted here is that this sequence works with either multiple DHCP servers on each VLAN, or that the **router/Layer3 switch** connecting the VLANs has **DHCP forwarding capability**.

Some options also exist to improve system start-up time. To improve phone download time, especially when a number (currently more than 400) of IP-Phones are associated with a controller, an external TFTP server, such as an NT server can be used. In the DHCP server, used by the phones, just alter the TFTP IP address to match and copy the download files onto the TFTP server. In this way multiple downloads can occur in parallel reducing system start-up time after a re-boot.

The sequence above assumes that the phones will get information from a DHCP server. There is also the possibility to manually programme up the IP-Phone with the same information as it starts to boot up. In this way the information is fixed, and requires little DHCP intervention. This method can be particularly useful where a phone is used on a remote WAN link and the router cannot forward DHCP requests, or where a local DHCP server does not exist. It can also be useful where VPNs are employed, for much the same reasons, that DHCP forwarding may not be available.

5.2 Start-up Sequence for the Controller

The sequence involves bringing up the RTC where call control lives. In this is included the DHCP and TFTP servers. In parallel the E2T is also 'brought into life' and a couple of the DHCP of options are used to identify the download code for this unit.

It is recommended that the VOIP controller DHCP server be used locally within the controller for devices on the voice VLAN. This can be disabled, but would then require an external DHCP server to service devices on the voice VLAN.

5.3 DHCP Options

The DHCP options to use within the DHCP server may differ from product release to product release, so it is recommended that the associated documentation for the product and release be consulted.

As an overview, the options currently used are shown here (product documentation is master):

DHCP Option	Information
003 – Router Address	IP Address, e.g. 192.167.22.251
066 – FTP IP address (same as option 129), for E2T	IP Address, e.g. 192.167.22.10
067 –Name of file on FTP server	"bootfile"
128 – (Specific) TFTP Server	IP Address, e.g. 192.167.22.10
129 – (Specific) RTC	IP Address, e.g. 192.167.22.10
130 – (Specific) IP Phone Load	"IP PHONE"
132 – (Specific) VLAN ID (32 bit)	0x2
133 – (Specific) Priority (32 bit)	0x6

5.4 DHCP Lease Time

To allow users to move off the local sub-net, or to let new people join a subnet, a method is needed to give up an IP address and also obtain a new address. If a phone is disconnected it obviously cannot talk to the DHCP server, so another method is needed to free up unused addresses. This is the DHCP lease time. This helps provide the Dynamic in DHCP by clearing out unused IP addresses and making them available for new requests.

The timer can be set from a few minutes to weeks. Typically **30 minutes** is a good time. It reduces the amount of checking to see if an IP address is still in use, as well as providing a reasonable recovery time to free up any unused addresses.

☐ **I confirm that my entire data infrastructure is in compliance with the guidelines in this document and understand that any variance from these guidelines will result in additional charges. I understand that the infrastructure must be in place and meet the attached guidelines, 5-business days prior to cut over of the telephone system. Upon notification from the customer that the network requirements have been met, TIG will attempt to hook-up and test the VOIP telephony system to the customers network to verify the integrity of the network to support VOIP. This one-time testing is included in the installation costs. If the network fails the initial VOIP verification testing, additional charges may be incurred.**

Signature_____**Title** _____
Date _____

☐ **I will not be using any IP devices or configurations currently on my existing data network, and therefore it is not necessary for me to conform to these requirements at this time. I do however understand that if in the future I do choose to add IP telephony to my network I will need to be in compliance with the current TIG guidelines.**

Signature_____**Title** _____
Date _____

☐ **I am subcontracting Telcom Innovations Group (or it's agents) on a time and materials basis at TIG's current professional services rate, to ensure that my network meets all the requirements articulated in this document. A separate work order will be issued to cover the scope of this work, which will be in addition to the original installation bid.**

Signature_____**Title** _____
Date _____

Mitel 6900w Series IP Phones Features Comparison Matrix

The following table provides an overview of some common features of the 6900w Series IP phones:

Display	6920w IP Phone	6930w IP Phone	6940w IP Phone
Color	Yes	Yes	Yes
Size (Diagonal)	8.9 cm (3.5 in)	11 cm (4.3 in)	17.8 cm (7 in)
Number of Pixels (W x H) Graphical Display	320 x 240	480 x 272	800 x 480
Brightness Adjust	Yes	Yes	Yes
Function Keys	**6920w IP Phone**	**6930w IP Phone**	**6940w IP Phone**
***Programmable Feature Keys**	18	72	96
Fixed Feature Keys	12	10	10
Softkeys	3	5	6
Multi-line	Yes	Yes	Yes
Speakerphone / Headset Key	Yes	Yes	Yes
Mute Key	Yes	Yes	Yes
Hold	Yes	Yes	Yes
Redial	Yes	Yes	Yes
Hang-up	Yes	Yes	Yes
Volume Up / Down Keys	Yes	Yes	Yes
Ringer Up / Down Keys	Yes	Yes	Yes
Settings Key	Yes	Yes	Yes
Message Key	Yes	Yes	Yes

Contacts Key	Yes	Yes	Yes
Transfer / Conference Key	Yes	No (Softkey)	No (Softkey)
Indicators	**6920w IP Phone**	**6930w IP Phone**	**6940w IP Phone**
Feature / Line Appearance LEDs	Yes	Soft via Display	Soft via Display
Message Waiting LED	Red	Red	Red
Mobile Connecting LED (Blue)	No	Yes	Yes
Hold	Yes	Soft via Display	Soft via Display
Ringer LED	Red	Red	Red
Speakerphone / Headset LED	Red	Red	Red
Microphone Mute LED	Red	Red	Red
Acoustic Functions	**6920w IP Phone**	**6930w IP Phone**	**6940w IP Phone**
Ringing Volume Adjust	Yes	Yes	Yes
Handset Volume Adjust	Yes	Yes	Yes
Handsfree Speakerphone	Yes	Yes	Yes
Handsfree: Full Duplex (FD)	FDHF	FDHF	FDHF
Wideband HD Audio (7kHz)	Yes	Yes	Yes
On-Hook Dialing	Yes	Yes	Yes
On-Hook Call Announce (Paging Receive Capability)	Yes	Yes	Yes
Off-Hook Call Announce	Yes	Yes	Yes
Amplified Receive > 12dB	Yes	Yes	Yes

Hearing Aid Compatible (HAC) Handset	Yes	Yes	Yes
Embedded Applications	**6920w IP Phone**	**6930w IP Phone**	**6940w IP Phone**
MobileLink	Yes	Yes	Yes
PCLink	Yes	Yes	Yes
Mobile Contacts	Yes	Yes	Yes
Corporate Contacts (MiVB)	Yes	Yes	Yes
Corporate Contacts (External LDAP)	Yes	Yes	Yes
Personal Contacts	Yes	Yes	Yes
Call History	Yes	Yes	Yes
Settings	Yes	Yes	Yes
Screen Saver	No	Yes	Yes
Custom Screen Saver / Idle Screen Branding	No	Yes	Yes
Physical	**6920w IP Phone**	**6930w IP Phone**	**6940w IP Phone**
Desk / Wall Mountable	Yes	Yes	Yes
Two-angle Desk Stand	Yes	Included	Included
Length of Handset Cord	3 m / 10’	3 m / 10’	3 m / 10’
LAN Ports	2-Port (10/100/1000)	2-Port (10/100/1000)	2-Port (10/100/1000)
Ethernet Cable (2m / 7’)	Included	Included	Included
Codec Support	G.711 G.722, G722.1 G.729 (MiNet only) G.726, iLBC AMR,	G.711, G.729, G.722, G.722.1 (MiNet only), G.726, iLBC AMR, G722.2 AMR-WB (SIP only)	G.711, G.729, G.722, G.722.1 (MiNet only), G726, iLBC AMR, AMR-WB

	G722.2 AMR-WB (SIP only)		(G.722) (SIP only)
Powered USB 2.0 Host Port	Yes (500mA)	Yes (500mA)	Yes (500mA)
Bluetooth 5.2	Yes (Embedded)	Yes (Embedded)	Yes (Embedded)
Voice QoS (802.1p/Q) VLAN and priority tagging	Yes	Yes	Yes
Encryption 128 bit AES (Advanced Encryption Standard)	128-bit AES	128-bit AES	128-bit AES
IEEE 802.1x Support	Yes	Yes	Yes
CLASS B Support	Yes	Yes	Yes
MTBF Rate (Years)	40.0	40.0	40.0
Wideband HD Handset with shouldering ribs	Yes, corded.	Yes, corded. (Bluetooth Cordless Optional)	Bluetooth Cordless
Headset Jack with EHS/DHSG support	Yes	Yes	No
USB Headset Support	Yes	Yes	Yes
Bluetooth Headset Support	Yes	Yes	Yes
Peripherals Support	**6920w IP Phone**	**6930w IP Phone**	**6940w IP Phone**
Cordless (BT) Handset	No	Yes (Optional)	Yes (Standard)
M695 28 Button PKM	No	Yes	Yes
WLAN Adapter	Yes	Yes	Yes
Powering Options	**6920w IP Phone**	**6930w IP Phone**	**6940w IP Phone**
Ethernet / AC Power (48VDC LAN Power)	Yes	Yes	Yes

802.3af Power over Ethernet (PoE)	Yes	Yes	Yes
IEEE PoE Class (excluding accessories)	2	3	3
Power Consumption	**6920w IP Phone**	**6930w IP Phone**	**6940w IP Phone**
Idle	1.3W	1.3W	1.8W
Typical (Active)	3.4W	3.4W	9.0W
Minimum System / Software Requirements	**6920w IP Phone**	**6930w IP Phone**	**6940w IP Phone**
MiVoice Business	Release 9.0 SP3 or later	Release 8.0 or later	Release 8.0 or later
MiVoice Border Gateway (Teleworker)	Release 11 or later	Release 9.4 or later	Release 9.4 or later
MiVoice Connect	Release 19.1 or later	Release 19.1 or later	Release 19.1 or later
MiCollab Client	Release 9.0 or later	Release 7.2.2 or later	Release 7.2.2 or later
MiVoice 5000	Release 7.1 or later	Release 6.4 or later	Release 6.4 or later
MiVoice MX-ONE	Release 7.3 or later	Release 6.3 or later	Release 6.3 or later

*Feature support may not apply to all Mitel solutions.

Mitel 6920w IP Phone

Designed for the enterprise user who requires flexibility & reliability

Key Features

- 3.5" QVGA (320x240 pixel) color display
- Wi-Fi – dual band 802.11 a/b/g/n
- Bluetooth 5.2
- Mitel PCLink
- MobileLink mobile device integration
- Mobile phone charging point
- High quality full-duplex speakerphone
- Native EHS/DHSG analog headset support
- USB port for headsets and accessorie

The 6920w is designed for power users who demand not only a modern design but also a phone that is flexible and delivers a high-quality communications experience. The 6920w provides flexible network connectivity options including wired Ethernet and built-in Wi-Fi to facilitate installation in work-at-home and corporate environments. The 6920w's first-of-its-kind PCLink feature turns your phone into a high quality audio device for PC based video collaboration. PCLink enables seamless handling of both phone calls and PC audio through a single easy-to-use device. By connecting the phone to your favorite video collaboration solution you now have one centralized, high quality audio device for all communications. The 6920 is designed from the ground up to provide an exceptional HD audio experience with high quality full-duplex speakerphone and support for Mitel's H-Series USB and EHS/DHSG headsets.

PCLink

PCLink solves the challenge today's home-based and office bound workers face day-in and day-out – how to effectively manage two necessary but independent communications modes: traditional phone calls and PC based collaboration. PCLink gives you the best of both worlds in a single, familiar, easy-to-use, high quality audio device – the 6920w IP Phone. Using PCLink, you are no longer forced to use two separate audio accessories, one for your phone and one for your PC – all communications are managed by the 6920w. The 6920w frees you to work handsfree using the high-quality speakerphone or optional attached Mitel H-Series headset.

Mitel
Powering connections

MobileLink Mobile Integration

The 6920w IP Phone's MobileLink mobile device integration seamlessly marries mobile phone call audio and both contact and call log information with the desktop phone. Calls to the mobile phone can be answered on the 6920w just like any other call leveraging the superior audio performance and ergonomics of the 6920w. Mobile Phone contacts and call history are automatically synchronized with the 6920w allowing access to the same information on either device. A powered USB port suitable for charging a mobile phone is also built into the 6920w.

Flexible Headset Options

The 6920w provides BT and USB headset support and features an innovative analog headset port that uniquely provides dual support for DHSG and modular 4-pin headset connections.

Feature Keys

- *6 programmable keys with paging that enables up to 18 Lines, Speed Dials and Telephony functions**
- *4 context sensitive keys with paging support**
- *4-way navigation key*
- *11 dedicated feature keys plus dial pad*

Audio and Codecs

- *Mitel Hi-Q Audio Technology*
- *Hearing aid compatible (HAC) handset*
- *Full-duplex high-quality speakerphone*
- *Codecs (supported codecs differ based on call manager platform):*
  - » *G.711, G.729, G.722 G.722.1 (MiNet Only)*
  - » *G.726, iLBC AMR, G.722.2 AMR-WB (SIP Only)*

Display and Indicators

- *3.5" QVGA (320x420 pixel) color display*
- *Intuitive graphical user interface and navigation menus*
- *Adjustable screen brightness*
- *Programmable key status indicators*
- *Dedicated LED for call and message waiting indication*

Protocol Support

- *SIP protocol support*
  - *-Mitel and 3rd Party call control*
- *Mitel IP (MiNet) protocol support*

Connectivity

- *Wi-Fi – dual band (2.4GHz / 5GHz) 802.11 a/b/g/n*
- *Dual Gigabit Ethernet ports - LAN + PC*
- *Bluetooth (BT) version 5.2*
- *Powered USB 2.0 Host port (500mA)*
- *Sidecar expansion port*
- *Dedicated 4-pin modular headset port convertible to DHSG capable headset port*

Integration

- *PCLink – use phone for PC audio via BT*
- *MobileLink*
  - » *Mobile pairing via BT*
  - » *Mobile Call Audio via desk phone*
  - » *Mobile Contact Sync*
  - » *Mobile Call Log Sync*
- *Mobile Charging (USB port)*
- *Support for Mitel Teleworker Solution, Automatic Call Distribution (ACD) agent and supervisor, hot desking, and resiliency*
- *Secure encrypted voice communication*
- *Quality of Service support – IEEE 802.1 p/Q VLAN and priority tagging*
- *IEEE 802.1x authentication support*

Powering

- *Designed for power conservation*
- *Accepts IEEE 802.3az Energy Efficient Power over Ethernet (POE)*
- *POE Class 3 with automatic POE class change on Expansion Module Installation*
- *Supports local power via 48V wall adapter*

Power Consumption

- *Idle 1.3w Typical 3.4*

Environmental / Regulatory Standards

EMC

CANADA:

ICES-003 (CLASS B)

RSS-247

USA:

CFR Title 47, Part 15 Subpart B (CLASS B)

FCC Part 15 Subpart C

EUROPE:

EN55024 (EU)

EN55032, Class B

EN 301-489-1-17
EN 300 328

EN 50360

AUSTRALIA / NEW ZEALAND:

AS/NZS CISPR 22

Safety

CANADA:

CAN/CSA C22.2 No. 60950-1

USA:
UL 60950-1

EUROPE:

EN 60950-1

AUSTRALIA / NEW ZEALAND:

AS/NZS 60950-1

Telecom

CANADA:

CS03 Part V (Hearing Aid Compatible)

USA:

FCC part 68 (CFR 47) (Hearing Aid Compatible)

AUSTRALIA / NEW ZEALAND:

PTC220

AS/CA S004

AS/ACIF, S040

Temperature Ratings

- *Operational:*
  » Operational +4°C to +49°C

  » Humidity 34% at +49°C 95% at +29°C
- *Storage:*
  » Operational -30°C to +70°C

  » Humidity 15% at +70°C 95% at +29°C

Other

- *MTBF Rate: 40 years*
- *Size (L x W x H): 8.9 in x 5.9 in x 7.5 in (22.5cm x 15cm x 19cm)*
- *Weight: 2.2 lbs or 0.98kg*

**Note: Maximum number of functions varies by call manager platform*

DS-6920w-858116-R2208-EN

Mitel 6930w IP Phone

Powerful, Wi-Fi equipped IP phone designed for the power user

Key Features

- 4.3" (480x272 pixel) color display
- Wi-Fi – dual band 802.11 a/b/g/n
- Bluetooth 5.2
- Mitel PCLink
- MobileLink mobile device integration
- Mobile phone charging point
- Support for optional Cordless handset
- Enhanced full-duplex speakerphone
- Highly customizable via broad array
- of optional add-on accessories

The Mitel 6930w is designed for power users who need a phone that can be tailored to their specific communication needs. The 6930w provides flexible network connectivity options including wired Ethernet and built-in Wi-Fi to facilitate installation in work-at-home and corporate environments. The 6930w's first-of-its-kind PCLink feature turns your phone into a high quality audio device for PC based video collaboration. PCLink enables seamless handling of both phone calls and PC audio through a single easy-to-use device. By connecting the phone to your favorite video collaboration solution you now have one centralized, high quality audio device for all communication. The enhanced full-duplex speakerphone and optional accessories like the Mitel integrated DECT cordless or H-Series headset and Bluetooth cordless handset give you the flexibility you need fit with the way you work.

PCLink

PCLink solves the challenge today's home-based workers face day-in and day-out – how to effectively manage two necessary but independent communications modes: traditional phone calls and PC based collaboration. PCLink gives you the best of both worlds in a single, familiar, easy-to-use, high quality audio device – the 6930w IP Phone. Using PCLink, you are no longer forced to use two separate audio accessories, one for your phone and one for your PC – all communications are managed by the 6930w. The 6930w frees you to work handsfree using the high-quality speakerphone or the optional integrated cordless DECT headset, that allows you to roam about your house or office floor thanks to its exceptional operating range.

Mitel
Powering connections

MobileLink Mobile Integration

The 6930w IP Phone's MobileLink mobile device integration seamlessly marries mobile phone call audio and both contact and call log information with the desktop phone. Calls to the mobile phone can be answered on the 6930w just like any other call leveraging the superior audio performance and ergonomics of the 6930w. Mobile Phone contacts and call history are automatically synchronized with the 6930w allowing access to the same information on either device. A powered USB port suitable for charging a mobile phone is also built into the 6930w.

Flexible Headset Options

The Mitel 6930w offers a unique, physically integrated DECT cordless headset option that provides unparalleled integration between phone and headset. The 6930w also provides BT and USB headset support and features an innovative analog headset port that uniquely provides dual support for DHSG and modular 4-pin headset connections.

Feature Keys

- *12 programmable keys with paging that enables up to 72 Lines, Speed Dials and Telephony functions**
- *5 context sensitive keys with paging support**
- *4-way navigation key*

Audio and Codecs

- *Hearing aid compatible (HAC) handset*
- *Full-duplex high-quality speakerphone*
- *Codecs (supported codecs differ based on call manager platform/cloud service):*
  - » *G.711, G.729, G.722 G*
  - » *722.1 (MiNet Only)*
  - » *G.726, iLBC AMR, G.722.2 AMR-WB (SIP Only)*

Display and Indicators

- *4.3" QVGA (480x272 pixel) color display*
- *Intuitive graphical user interface and navigation menus*
- *Adjustable screen brightness for user comfort in different lighting environments*
- *Programmable key indicators*
- *Dedicated LED for call and message waiting and Mobile Device Connect indication*

Protocol Support

- *SIP protocol support*
  - *-Mitel and 3rd Party call control*
- *Mitel IP (MiNet) protocol support*

Connectivity

- *Wi-Fi – dual band (2.4GHz / 5GHz) 802.11 a/b/g/n*
- *Dual Gigabit Ethernet ports - LAN + PC*
- *Bluetooth (BT) version 5.2*
- *Powered USB 2.0 Host port (500mA)*
- *Sidecar expansion port*
- *Dedicated 4-pin modular headset port convertible to DHSG capable headset port*

Integration

- *PCLink – use phone for PC audio via BT*
- *MobileLink*
  - *» Mobile pairing via BT*
  - *» Mobile Call Audio via desk phone*
  - *» Mobile Contact Sync*
  - *» Mobile Call Log Sync*
- *Mobile Charging (USB port)*
- *Support for Mitel Teleworker Solution, Automatic Call Distribution (ACD) agent and supervisor, hot desking, and resiliency*
- *Secure encrypted voice communication*
- *Quality of Service support – IEEE 802.1 p/Q VLAN and priority tagging*
- *IEEE 802.1x authentication support*

Powering

- *Designed for power conservation*
- *Accepts IEEE 802.3az Energy Efficient Power over Ethernet (POE)*
- *POE Class 3 with automatic POE class change on Expansion Module Installation*
- *Supports local power via 48V wall adapter*

Power Consumption

- *Idle 1.3w Typical 3.4*

Environmental / Regulatory Standards

EMC

CANADA:

ICES-003 (CLASS B)

RSS-247

USA:

CFR Title 47, Part 15 Subpart B (CLASS B)

FCC Part 15 Subpart C

EUROPE:

EN55024 (EU)

EN55032, Class B

EN 301-489-1-17
EN 300 328

EN 50360

AUSTRALIA / NEW ZEALAND:

AS/NZS CISPR 22

Safety

CANADA:

CAN/CSA C22.2 No. 60950-1

USA:
UL 60950-1

EUROPE:

EN 60950-1

AUSTRALIA / NEW ZEALAND:

AS/NZS 60950-1

Telecom

CANADA:

CS03 Part V (Hearing Aid Compatible)

USA:

FCC part 68 (CFR 47) (Hearing Aid Compatible)

AUSTRALIA / NEW ZEALAND:

PTC220

AS/CA S004

AS/ACIF, S040

Temperature Ratings

- *Operational:*
  - *» Operational +4°C to +49°C*
  - *» Humidity 34% at +49°C 95% at +29°C*
- *Storage:*
  - *» Operational -30°C to +70°C*
  - *» Humidity 15% at +70°C 95% at +29°C*

Other

- *MTBF Rate: 40 years*
- *Size (L x W x H): 9.3 in x 5.9 in x 7.5 in (23.5cm x 15cm x 19cm)*
- *Weight: 2.4 lbs or 1.08 kg*

Note: Maximum number of functions varies by call manager platform

Mitel 6940w IP Phone

Powerful Wi-Fi equipped IP phone designed for the executive user

Key Features

- 7” (800x480 pixel) color LCD Touch Display
- Wi-Fi – dual band 802.11 a/b/g/n
- Bluetooth 5.2
- Mitel PCLink
- MobileLink mobile device integration
- Mobile phone charging point
- Cordless handset
- Enhanced full-duplex speakerphone
- Highly customizable via broad array of optional add-on accessories

The Mitel 6940w is designed for the executive user who demands an exceptional device that meets their demanding communication needs. The 6940w provides flexible network connectivity options including wired Ethernet and built-in Wi-Fi to facilitate installation in work-at-home and corporate environments. The 6940w’s first-of-its-kind PCLink feature turns your phone into a high quality audio device for PC based video collaboration. PCLink enables seamless handling of both phone calls and PC audio through a single easy-to-use device. By connecting the phone to your favorite PC video collaboration solution you now have one centralized audio device for all communication. The enhanced full-duplex speakerphone, cordless handset and optional Mitel integrated DECT cordless or H-Series headset give you the flexibility you need to fit with with the way you work.

Mitel PCLink

PCLink solves the challenge today’s home-based workers face day-in and day-out – how to effectively manage two necessary but independent communications modes: traditional phone calls and PC based collaboration. PCLink gives you the best of both worlds in a single, familiar, easy-to-use, high quality audio device – the 6940w IP Phone. Using PCLink you are no longer forced to use two separate audio accessories, one for your phone and one for our PC – all communications are managed by the 6940w. The 6940w frees you to work handsfree using the high-quality speakerphone or optional integrated cordless DECT headset, that allows you to roam about your house or office floor thanks to its exceptional operating range.

Mitel
Powering connections

Mobile Integration

The 6940w IP Phone's MobileLink mobile device integration seamlessly marries mobile phone call audio and both contact and call log information with the desktop phone. Calls to the mobile phone can be answered on the 6940w just like any other call leveraging the superior audio performance and ergonomics of the 6940w. Mobile Phone contacts and call history are automatically synchronized with the 6940w allowing access to the same information on either device. A powered USB port suitable for charging a mobile phone is also built into the 6940w.

Flexible Headset Options

The Mitel 6940w offers a unique, physically integrated DECT cordless headset option that provides unparalleled integration between phone and headset. The 6940w also provides BT and USB headset connectivity support.

Feature Keys

- *Personal programmable soft keys for access to up to 96 Lines, Speed Dials and Telephony functions**
- *Context sensitive soft keys*
- *Touch-based navigation*

Audio and Codecs

- *Hearing aid compatible (HAC)cordless handset*
- *Full-duplex high-quality speakerphone*
- *Codecs (supported codecs differ based on call manager platform/cloud service):*
  - » *G.711, G.729, G.722 G*
  - » *722.1 (MiNet Only)*
  - » *G.726, iLBC AMR, G.722.2 AMR-WB (SIP Only)*

Display and Indicators

- *7" (800x480 pixel) color display*
- *Intuitive graphical user interface and navigation menus*
- *Adjustable screen brightness for user comfort in different lighting environments*
- *Programmable key indicators*
- *Dedicated LED for call and message waiting and Mobile Device Connect indication*

Protocol Support

- *SIP protocol support*
  - *-Mitel and 3rd Party call control*
- *Mitel IP (MiNet) protocol support*

Connectivity

- *Wi-Fi – dual band (2.4GHz / 5GHz) 802.11 a/b/g/n*
- *Dual Gigabit Ethernet ports - LAN + PC*
- *Bluetooth (BT) version 5.2*
- *Powered USB 2.0 Host port (500mA)*
- *Sidecar expansion port*

Integration

- *PCLink – use phone for PC audio via BT*
- *MobileLink*
  - » *Mobile pairing via BT*
  - » *Mobile Call Audio via desk phone*
  - » *Mobile Contact Sync*
  - » *Mobile Call Log Sync*
- *Mobile Charging (USB port)*
- *Support for Mitel Teleworker Solution, Automatic Call Distribution (ACD) agent and supervisor, hot desking, and resiliency*

- *Secure encrypted voice communication*
- *Quality of Service support – IEEE 802.1 p/Q VLAN and priority tagging*
- *IEEE 802.1x authentication support*

Powering

- *Designed for power conservation*
- *Accepts IEEE 802.3az Energy Efficient Power over Ethernet (POE)*
- *POE Class 3 with automatic POE class change on Expansion Module Installation*
- *Supports local power via 48V wall adapter*

Power Consumption

- *Idle 1.8w Typical 9.0*

Environmental / Regulatory Standards

EMC

CANADA:

ICES-003 (CLASS B)

RSS-247

USA:

CFR Title 47, Part 15 Subpart B (CLASS B)

FCC Part 15 Subpart C

EUROPE:

EN55024 (EU)

EN55032, Class B

EN 301-489-1-17
EN 300 328

EN 50360

AUSTRALIA / NEW ZEALAND:

AS/NZS CISPR 22

Safety

CANADA:

CAN/CSA C22.2 No. 60950-1

USA:
UL 60950-1

EUROPE:

EN 60950-1

AUSTRALIA / NEW ZEALAND:

AS/NZS 60950-1

Telecom

CANADA:

CS03 Part V (Hearing Aid Compatible)

USA:

FCC part 68 (CFR 47) (Hearing Aid Compatible)

AUSTRALIA / NEW ZEALAND:

PTC220

AS/CA S004

AS/ACIF, S040

Temperature Ratings

- *Operational:*
  - *» Operational +4°C to +49°C*
  - *» Humidity 34% at +49°C 95% at +29°C*
- *Storage:*
  - *» Operational -30°C to +70°C*
  - *» Humidity 15% at +70°C 95% at +29°C*

Other

- *MTBF Rate: 40 years*
- *Size (L x W x H): 9.7 in x 5.9 in x 7.5 in (24.5cm x 15cm x 19cm)*
- *Weight: : 2.6 lbs or 1.18 kg*

**Note: Maximum number of functions varies by call manager platform*

DS-6940w--806740-R2208-EN

The Mitel Headset Lineup

Designed for professionals

Key Benefits

- Designed for all-day comfort
- Built with premium materials to ensure long lasting performance
- High value features for enhancing productivity
- Audio enrichment capabilities reduce user fatigue
- Noise cancelling microphones ensure clear conversations
- Noise shielding ear cuffs allow for greater concentration on the task at hand
- Fully supported with Mitel applications and 6900 / 6800 desktop phones

Mitel's headset family delivers a range of high-quality headsets from industry leading headset manufacturer, Jabra to address a range of softphone and desk phone-based user needs. Whether working from a home office or as an agent in a busy contact center, Mitel has a headset that will satisfy what's needed to effectively tackle the task at hand.

Flexible working

During the pandemic, workers have been working from home and now that they are entering the post pandemic phase, there is a clear transition that workers will utilize the flexibility to use their home environment in combination with their previous office environment. The new normal is no longer a single location but various locations to support convenience, functionality and well-being and encourage connection with customers and colleagues.

This new normal will also drive businesses to provide certified headsets to their employees that allow them to be as productive as possible wherever they are. Employee needs vary depending on role and use, so the choice of headset is based on a variety of factors including weight, durability, comfort, corded versus cordless, mono versus stereo, noise reduction and busy light capability to reduce interruptions.

To support this shift, Mitel provides a number of headsets that support everything from home office workers to the advanced contact center agent. Mitel headsets have been tested and certified with Mitel applications and desk phones to ensure compatibility and eliminate interoperability issues that can arise with 3rd party headsets available on the market. In addition to support new work experiences and productivity-enhancing solutions, Mitel's headsets are built with high quality materials such as aluminium hinges and steel headbands that

result in long lasting performance with fewer returns and reduced support tickets. Mitel is so confident in the reliability of our Contact Center headset models we back them with a 3-year warranty to give you peace of mind in your headset investment.

User hearing protection and long-term well being

PeakStop™

Stops sudden peaks in volume. It constantly monitors the sound level of your conversation. Whenever a sound spike comes in, PeakStop cuts off the "loud" part. Any sound above 118 decibels is considered too loud and is suppressed.

IntelliTone™

IntelliTone is there to ensure that the average sound level you're exposed to during your working day doesn't leave you deaf. Headsets with IntelliTone let you personalize the sound level to your preference and ensures audio stays within this envelop.

SafeTone™

Combines PeakStop and IntelliTone into a single audio enhancement feature.

Note: Audio enhancement features vary by model.

The importance of speech clarity

From a recent study, contact center agents indicated that customer conversations are often are difficult to hear and contribute to agent fatigue. Mitel's headsets targeting contact center agents are optimized for speech clarity and intelligibility making for a more pleasant audio experience.

H10 Stereo USB Headset – PC and Deskphone

Engineered to keep you on task thanks to exceptional audio, outstanding noise isolation and superior comfort

*The H10 is a corded **stereo** headset with an advanced digital chipset and three strategically placed **noise cancelling** microphones, for less background conversation noise on your calls.*

*You'll never miss a thing, thanks to **powerful leak-tolerant 40mm speakers** and advanced digital chipset, delivering audio that always keeps you in the loop.*

*Designed to the **perfect shape** using biometric measurements from hundreds of heads, added soft memory foam cushions that mold to your ear's natural contours, and assembled using **durable, premium materials**.*

***Boom-arm** mute and auto-answer.*

***Motion sensor** to detect use.*

***Busylight** provided on each earcup that can be seen from **every angle** so you can work in peace.*

- *Connects to PC or Mitel IP Phones via USB-A.*
- *Supported IP Phone models: Mitel: 6920, 6930, 6940, 6867, 6869, 6873*

DS-Headsets-787464-R2108-EN

H20 Mono Analog Desk Phone Headset – Deskphone

Built to last for high-performing contact center agent use

*The H20 has an **extremely lightweight** and unobtrusive design resulting in lowered agent fatigue and more **productive calls**.*

*Includes three wearing styles – **headband, neckband, and ear-hook** – providing ultimate flexibility to tailor the headset to personal wearing preference.*

*Features a reinforced cord that is built to **withstand heavy use** by protecting against office chair wheels and sharp objects.*

*Specially designed "air shock" **noise-cancelling mic** filters out sharp breathing sounds and popping noises often heard in conversations*

*Boom arm can be **rotated 360 degrees** with zero risk of breaking.*

- *Connects to Mitel IP Phones via RJ9 headset port*
- *Supported IP Phone models: Mitel 6910, 6920, 6930, 6865, 6867, 6869, IP420/420G, IP480/480G, IP485G*

H30 Stereo USB Headset – PC and Deskphone

Engineered for softphone environments, with features that combat background noise and reduce interruptions

The H30 provides a unique, ***3-microphone system*** *with intelligent* ***noise-cancelation*** *that filters out background noise and breathing sounds, giving callers a superior experience.*

Built for intense use with ***reinforced cords*** *and a flexible, 300-degree* ***adjustable boom*** *arm that reduces the risk of breakage.*

Stereo sound*, and super wideband audio help agents have vibrant, lifelike conversations – with the highest levels of* ***hearing protection***

Features ***multi-color status lights*** *on both earcups, which are clearly visible from all angles, to make sure interruptions are kept to a minimum.*

Designed for all day ***wearing comfort****.*

Adjusting earcups - The soft earcups rotate to fit users' head optimally – ensuring good fit and noise seal.

Lightweight *- Only about 30% of the weight of an average consumer headset.*

No pressure - ***Easy feeling*** *with low pressure on users' ears and head.*

Programmable ***Statuslight****.*

Excellent *microphone performance.*

Passive ***noise cancellation****.*

User ***hearing protection*** *and volume normalization.*

- *Connects directly to PC's USB-C port or via the included UCB-C to UCB-A extender cable that also provides a quick disconnect capability*

DS-Headsets-787464-R2108-EN

Integrated DECT Cordless Headset – Deskphone

Unique phone-attached DECT wireless headset add-on

*Physically **attaches to 6930 & 6940** IP Phones to reduce desktop clutter and eliminate need for additional headset power adapter.*

*Provides **noise-cancelling** microphone making it ideal for noisy environments.*

*Includes two wearing styles – headband and ear-hook – providing **flexibility to tailor** the headset to personal wearing preference.*

*Provides **wireless connectivity** to a range of up to **100 meters** / 300 feet with no loss in connection quality*

*Supports all day use with up to **8 hours** of talk time**

Seamless headset button integration ensures reliable and intuitive operation.

- *Attaches to phone or PKM via sidecar expansion port*
  (support for up to 3 PKMs + Integrated DECT Headset attached to phone)
- *Powered directly by the MiVoice 6930 or MiVoice 6940 IP Phone*

Integrated DECT – Wireless Technology

- *DECT*
  - *Operating at 1.9GHz*
- *Frequency Bands*
  - *1880 – 1900 MHz (Standard DECT) (UK / Europe)*
  - *1920 – 1930 MHZ (DECT 6.0) (USA/CA)*
- *Transmission Power*
  - *63mW*
- *Power Consumption*
- *3W*

* Dependent on usage

H40 Stereo DECT Cordless Headset - PC and Deskphone

Industry-leading wireless performance for ultimate freedom of movement while staying connected

*The H40 provides superior wireless connectivity to a range of up to **150 meters** / 490 feet with no loss in connection quality.*

*Supports all day use with up to **13 hours** of talk time*.*

*Advanced **noise-cancelling** microphone and enhanced stereo speakers deliver **crystal-clear** calls even in noisy environments*

***Busylight** provided on both earcups plus indicator in boom-tip serve as "do-not-disturb" indicators to colleagues in immediate surroundings.*

- *Connects to PC or Mitel IP Phones via USB or Mitel IP Phones via RJ9 headset port*
- *Supported IP Phone models: Mitel 6910, 6920, 6930,6940, 6865, 6867, 6869, 6873, IP420/420G, IP480/480G, IP485G*

Battery

- *Talk time: Up to 13**
- *Standby time: Up to 52 hours (improves with use of power nap feature)**
- *AC power supply: Yes*
- *Battery charge time*
  - *40% after 30 min*
  - *80% after 60 min*
  - *100% after 90 min*

Wireless Technology

- *DECT*
  - *Operating at 1.9GHz*
- *Frequency Bands*
  - *1880 – 1900 MHz (Standard DECT) (UK / Europe)*
  - *1920 – 1930 MHZ (DECT 6.0) (USA/CA)*
- *Transmission Power*
  - *63mW*
- *Power Consumption*
  - *3W*

* Dependent on usage

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Technical Specifications

Feature/Headset	H10 - Stereo	H20 - Mono	H30 - Stereo	H40 - Stereo	DECT Integrated
Audio User sound Protection	SafeStop™	PeakStop™ 118 dBA SPL (RMS)	PeakStop™ 105 dB SPL, IntelliTone™ 2.0	SafeTone™	Noise cancelling
Speaker Size	Ø 40mm	NB: Ø 30 x 6.8mm WB: Ø 30 x 6.4mm	28 x 3.9 mm	2 pcs Ø 28 x 3.9mm	
Speaker Max input power	30 mW	20mW	10mW (at 0.56 V)	<118 dBSPL(A)	<118 dBSPL(A)
Speaker sensitivity		NB: 10 dB Pa/V ±3dB WB: 8 dB Pa/V ±3dB	115 dB SPL@0.4V,1kHz		21,5 dB Pa/V
Speaker impedance		300Ω ±15 %/1kHz/ 1.0V	32 Ohms		32 Ohms
Speaker frequency range	20Hz-20.000Hz	NB: 100Hz to 4.500Hz WB: 150Hz – 6.800Hz	20Hz – 20kHz	40Hz-16kHz	
Speaker bandwidth music mode	20Hz-20.000Hz	NB: 100Hz to 4.500Hz WB: 150Hz – 6800Hz	20Hz – 20kHz	40Hz-16kHz	
Speaker bandwidth speak mode	100Hz-14.000Hz	NB: 100Hz to 4.500Hz WB: 150Hz – 6.800Hz	50Hz – 20kHz	150 - 6.800Hz	150-7kHz
Microphone type	3 Digital MEMS	Noise cancelling, Uni-directional	Digital MEMS microphones	Dual Microphone - ECM Uni-Directional and Analog MEMS system	Electret Condenser Microphone Uni-directional
Microphone sensitivity	-26 dBFS/Pa	STD NC: -30 dB V/Pa ±3dB, Pin=1Pa, 0dB=1V/Pa STD UNC: -28 dB V/Pa ±3dB, Pin=1Pa, 0dB=1V/Pa	-26dBFS@94dB SPL, 1kHz		-30 dBV/Pa
Microphone frequency range	100Hz-14kHz	101Hz – 8.000Hz	100Hz – 14kHz	100Hz-7.3kHz	100Hz –10.kHz
Microphone bandwith		100Hz – 8.000Hz	100Hz – 14kHz		
Microphone power consumption		Current consumption 70-150µA@RL=3.9kΩ, Vs=3.0V	630uA		70-150µA Operating Voltage: 2V
Power supply				AC	
Power consumption		N/A	Typ. 58mA	7.5V/650mA	
Battery	N/A	N/A	N/A	Yes/exchangeable	Through deskphone
Certifications		CE, FCC, UL, cUL, EAC, RCM, KCC, RoHS, REACH	CE, FCC, KCC, RCM, Noise at work, G616 and OSHA-compliant Industry Certifications: cTUVus	CE, CB, FCC, IC, NOM, NTC, EAC, PSB, ICASA, TELEC, SIRIM, ACMA, NZ Telepermit, UL	
General Main unit dimension	186x157x60.5mm 7.32x6.18x2.38in	141 x 183 x 67mm	150 x 193 x 62mm	Base: 93 x 90 x 106mm Headset: 14 x 32 x 169mm	
Weight	188g / 6.63oz with cable 168.5g/ 5.94oz without cable	61g / 2.15oz with cord 45g/ 1.57oz without cord	96g (without cord)	Base: 203g Headset: 83g	Unit: 505g Headset: 26g
Cord length		100cm	120cm		
Operating temperature	-10°C to +55°C, 14°F to 131°F	-10˚C to + 50˚C	-10°C to +40°C (Humidity 5%~85% RH)	-10°C to +55°C (non-condensing)	
Storage temperature	-5°C to +55°C, 23°F to 131°F	-30˚C to + 80˚C	-20°C to +50°C (Humidity 20%~90% RH)	-5°C to +45°C (non-condensing)	
Box content	Headset, soft pouch			Headset, base, power supply, USB cable, desk phone cable	
Charging plug dimensions				Ø 2.35mm	
Security				DECT Security Step C & using FIPS approved algorithms for key generation, payload encryption and authentication	64-bit digital encryption

Mitel 6970 IP Phone

A conference phone designed to make meetings easier

Key Features

- 7” 800x400 Color Touch Display
- Programmable keys
- 6 context-sensitive soft keys
- PoE power (802.3af)
- Bluetooth 4.1 enabled
- MobileLink feature
- One-touch Join Meeting
- 360° microphone pickups
- Mitel Hi-Q Audio Technology
- 2 USB ports

The Mitel 6970 IP Conference Phone designed to make meetings easier and more efficient. A large 7- inch color touch screen grants excellent visibility to an intuitive user interface for quick navigation to essential meeting information and functions. A tight integration with Mitel platforms, applications, call managers delivers a unique conference experience that will not be found with 3rd party devices. Built-in Bluetooth 4.1 and MobileLink grant you the ability to seamlessly pair with Bluetooth enabled audio devices and expand the capabilities of your mobile phone. Enjoy crystal clear audio with high definition speakers and 360° beam-forming microphones. With the Mitel 6970 IP Conference Phone, your entire meeting experience will be effortless.

High Resolution Color Touch Display

An exceptionally large high resolution 7” (800x 480 pixel) color touch display delivers a rich visual experience for maximum productivity.

Advanced Meeting Features

Business directory and calendar integrations save precious meeting minutes with one touch access to conference bridges and important contacts. MobileLink allows you wirelessly pair the 6970 IP Conference Phone with your mobile phone to seamlessly switch your devices while on an active call.

Intuitive User Interface

Navigate to essential conference functions quickly with a fluid user interface that is easy to understand.

Unmatched Audio Quality

Mitel’s Hi-Q audio technology and 360° beam-forming microphones allow far end conference participants to listen with ease to the active talker while background noise and side conversations are silenced. With an exceptional 16 ft (5m) pickup range, most room sizes can be accommodated without requiring optional extension microphones.

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Feature Keys

- *6 pages of 16 programmable Personal soft touch keys for access to Lines, Speed Dials and Telephony functions**
- *6 context sensitive touch soft keys*
- *7 dedicated touch feature keys*

Audio and Codecs

- *8 Beam-forming microphones for 360° audio pickup with 16 ft (5m) pickup range*
- *High output, high fidelity speaker*
- *Mitel Hi-Q Full Duplex Audio Technology*
- *Codecs (supported codecs differ based on call manager platform / cloud service):*
  - *G.711u/a, G.729, G.722, G.722.1 (Minet)*
  - *G.711u/a, G.729, G.722, G.726, iLBC, AMR, AMR-WB / G.722.2 (SIP)*

Display and Indicators

- *7" (800x480 pixel) color touch display*
- *Intuitive graphical user interface and navigation menus – same as 6900 desk phone UI*
- *Adjustable screen brightness for user comfort in different lighting environments*
- *Dedicated 360° visible LEDs for active call and mute indication*

Protocol Support

- *Mitel IP (MiNet) protocol support*
- *SIP (Session Initiation Protocol) protocol support*
  - *Mitel and 3rd Party call control*

Integration and Connectivity

- *MobileLink*
  » Mobile pairing via BT
  » Mobile Call Audio via desk phone
  » Mobile Contact Sync
  » Mobile Call Log Sync
- *Support for Mitel Teleworker Solution, personal ring group, hot desking, and resiliency*
- *Support for use with Mitel MiCollab Meeting Center application (one touch join MiCollab conferences)*
- *Support for Mitel Mass Notification & Mitel Revolution broadcast applications*
- *Multiple-languages support: English, French, German, Spanish, Spanish (Latin American), Portuguese, Portuguese (Brazilian), Dutch, Italian, Romanian, Russian, Swedish (downloadable language packs with SIP)*
- *Secure encrypted voice communication*
- *Quality of Service support – IEEE 802.1 p/Q VLAN and priority tagging*
- *IEEE 802.1x authentication support*
- *10/100/1000 Mbps Ethernet port*
- *Bluetooth 4.1 wireless interface*
- *2 x Extension Microphone ports*
- *Powered USB 2.0 Host port (500mA)*
- *USB 2.0 Device port*

Accessories

- *Optional wired extension microphones (2 pack) extend audio pickup for large boardroom use*

Powering

- *Accepts standards-based (IEEE 802.3af) Power over Ethernet (PoE)*
- *POE Class 3*
- *Idle 2.6w Typical 5.6w*

Available Accessories

- *Wall Mount Kit (50008299)*

Environmental / Regulatory Standards

EMC

CANADA:
ICES-003 (CLASS B)
RSS-247

USA:
CFR Title 47, Part 15 Subpart B (CLASS B)
FCC Part 15 Subpart C

EUROPE
EN55032, Class B
EN 301-489-1-17
EN 300 328
EN 50360

AUSTRALIA / NEW ZEALAND:
AS/NZS CISPR 2

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Safety

CANADA:
CAN/CSA C22.2 No. 60950-1

USA:
UL 60950-1

EUROPE
EN 60950-1

AUSTRALIA / NEW ZEALAND:
AS/NZS 60950-1

Telecom

CANADA:
CS03 Part V (Hearing Aid Compatible)

USA:
FCC part 68 (CFR 47) (Hearing Aid Compatible)

AUSTRALIA / NEW ZEALAND:
PTC220
AS/CA S004
AS/ACIF, S040

Temperature Ratings

- *Operational:*
  - *Operational +4°C to +49°C*
  - *Humidity 34% at +49°C, 95% at +29°C*
- *Storage:*
  - *Operational -30°C to +70°C*
  - *Humidity 15% at +70°C, 95% at +29°C*

Other

- *MTBF Rate: 40 years*
- *Dimensions (L x W x H): 18.1in x 10.6in x 5.5in (46cm x 27cm X 14cm)*
- *Weight: 4.1 lbs. (1.9kg)*

DS-6970-856209-R2205-EN

Mitel S720 Bluetooth Speakerphone

The Mitel S720 Bluetooth Speakerphone (S720 BT Speakerphone) allows customers to instantly transform any room into a conference room for up to six people. Extend the coverage to up to twelve people quickly and easily by wirelessly linking a second S720 BT Speakerphone. The S720 BT Speakerphone is the perfect solution for office side table and small meeting room conference calls.

The speakerphone functionality is tightly integrated with the Mitel 6930 and 6940 IP Phone's built-in Bluetooth 4.2 interface. Multiparty conference calls can be set up using the conferencing capability of the Mitel 6900 desk phone and then move to the S720 BT Speakerphone. Users can take the speakerphone on the road and leverage the Mitel MiCollab Softphone from the hotel room or other on-the-go conference calls.

The S720 BT Speakerphone features a lightweight design, a protective travel pouch, and boasts 15 hours of talk time before the battery needs to be recharged. The S720 BT Speakerphone doubles as a high-fidelity Bluetooth speaker when paired with the music player on the user's mobile phone.

Key Features of the S720 BT Speakerphone

- enhance the Mitel 6930 and 6940 IP phones with office side table / small meeting room conference phone capabilities
- connects to the Mitel 6930 and 6940 IP Phones' built-in Bluetooth wireless interface
- move call audio between IP Phone and S720 Bluetooth Speakerphone
- link two S720 BT Speakerphones together for extended coverage
- portable design – leverage Mitel's MiCollab Softphone when traveling. A protective travel pouch is included.
- clear HD voice wideband audio
- 360-degree microphone pickup (6ft/2m range)
- rechargeable battery via USB (15 hours of talk time)
- dual connect – Mitel 6900 and Mobile Phone

- doubles as a high-fidelity Bluetooth speaker when two S720 BT speakerphones are linked together, and pair it with a mobile phone music player to experience great sound
- can also be paired with a third-party Bluetooth device

Mitel MiCollab Audio, Web and Video Conferencing

Enhance any meeting with collaboration

Key Features

- Scheduled and ad-hoc conferences
- Desktop and application sharing
- Multi-point video conferencing
- Private and public chat
- Remote control
- Web-based collaboration
- File transfer
- Document management
- Polling
- Conference recording
- Custom access codes

With audio conferencing, video, and collaboration all in one location, your organization can easily enhance their next meeting - whether planned or 'in-the-moment'

Today employees can be found anywhere but in the same office making effective communications challenging. Mitel® MiCollab provides organizations with a secure, conferencing and collaboration tools that enable employees to connect and collaborate from virtually anywhere.

With MiCollab, audio, web, and video conferencing services are always available, no matter where your employees are located, enabling them to display, discuss, and collaborate on any document or desktop item, increasing productivity and the understanding between employees, partners, and customers.

To meet the highest security requirements, MiCollab uses Secure Sockets Layer (SSL) encryption for secured messages, server-side digital certificates, and Comprehensive Lightweight Application Security (CAST) encryption for data transmission during Web conferences. All MiCollab interfaces are accessed through the secure HTTPS protocol, with user authorization and authentication allowing only valid users to access services.

Capacity and performance

The following capacity and performance figures are based on single application MiCollab server deployments. If running multiple applications, the capacity and performance of MiCollab may be affected depending on the availability of server resources.

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AUDIO CONFERENCING

Total concurrent audio conference users	500
Maximum users per audio conference	300
Maximum concurrent users with G.729 encoding (Additional users with G.711 encoding can connect and join an audio conference up to the supported limits)	100

VIDEO CONFERENCING

Maximum users per video conference (Resolution, frame rate and video quality are bandwidth dependent. Maximum participants based on PC processing power required to decode the video streams)	8

WEB COLLABORATION*

Total concurrent web conference users	500
Maximum users per web conference	300

WEBRTC AUDIO**

Maximum concurrent WebRTC two-way audio users (Depends upon MiVoice Border Gateway vCPU and RAM capacity)	300

TECHNICAL SPECIFICATIONS

MiCollab Audio, Web, and Video language support (Client user interfaces (UI) and application telephone user interfaces (TUI))	Danish, Dutch, English, Finnish, French (Canadian & European), German, Italian, Mandarin Chinese, Norwegian, Portuguese (European), Spanish (L. American & European), and Swedish

Component	Requirement
Collaboration Client Computer Operating System	• Windows 7 Business / Enterprise / Ultimate Edition • Windows 8.0 and Windows 10 (both 32 and 64- bit versions), 8.1 Non-Metro
E-mail Client	• Microsoft® Outlook® 2010, 2013, or 2016 / MS Exchange 2013 and 2016 • IBM Lotus Notes® 9
Web Client Two-way WebRTC Audio	• Google® Chrome™ and Mozilla® Firefox® web browsers (Windows, Mac and Android OS)

WEB BROWSER REQUIREMENTS

Browser	Client version
Microsoft Internet Explorer®	11 or later
Microsoft Edge®	40 or later
Mozilla® Firefox®	59 or later
Apple® Safari®	10.1 or later
Google® Chrome™	66 or later

COMPATIBILITY WITH MITEL COMMUNICATIONS PLATFORMS

MiVoice platform	Software version
MiVoice Office 250	R6.2 (or higher)
MiVoice Office 400	R6.0 (or higher)
MiVoice Business	R7.2 SP1 (or higher) / (R8.0 or higher for MiTeam support)
MiVoice MX-ONE	R6.3 SP2 (or higher)
MiVoice 5000	R6.4 (or higher)

* Server rating based upon the hardware and is set at a maximum before the performance is noticeably impacted. The MiCollab server does not prevent more than the supported limits; it only enforces what is licensed.

** Mitel's MiVoice Border Gateway server provides MiCollab with WebRTC capabilities required for two-way audio for the Web collaboration client. A server with 12 vCPU and 4GB RAM can provide support for up to 445 WebRTC users and a configuration of 4vCPU and 2GB RAM providing support for up to 130 users.

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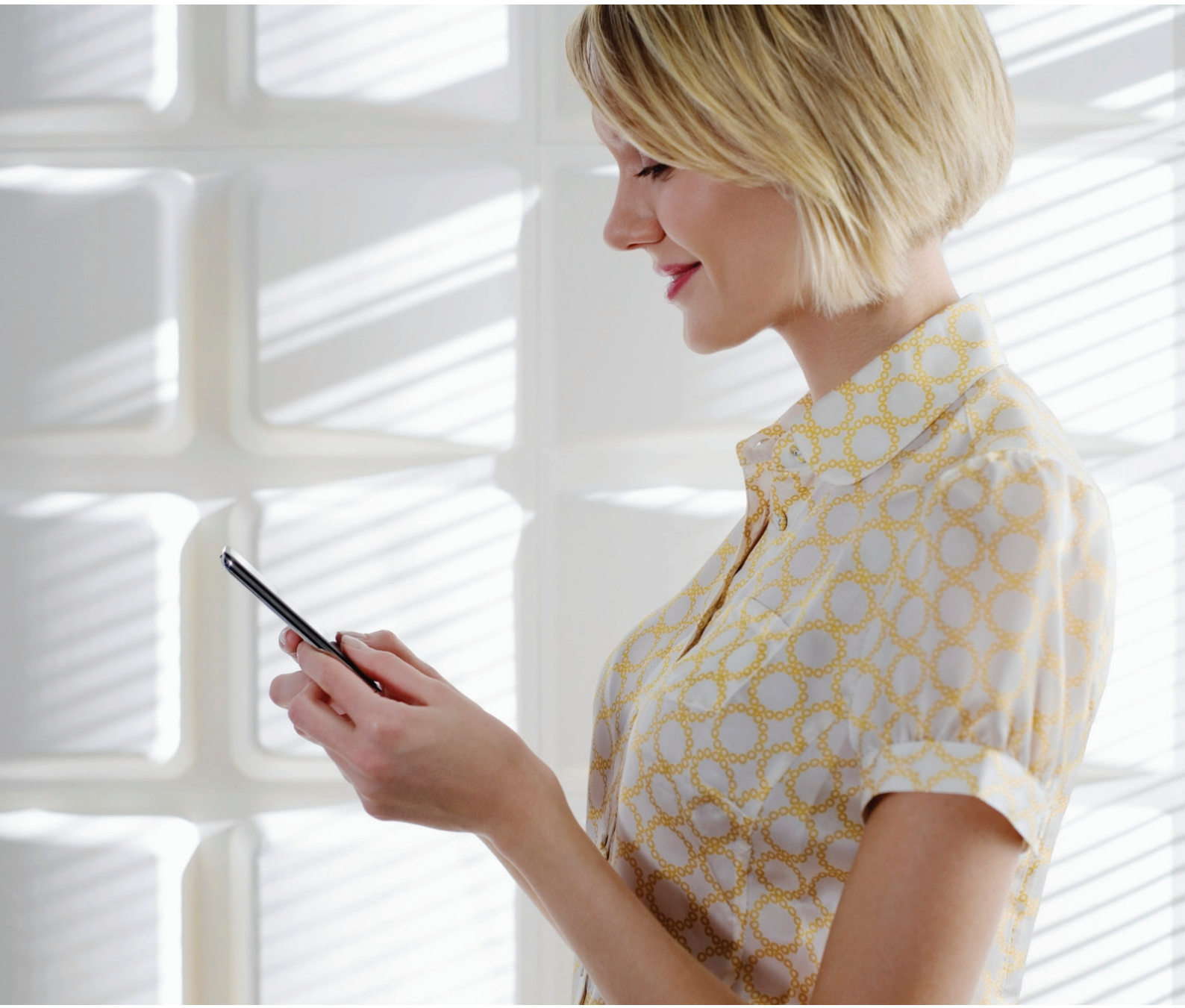
Mitel MiCollab

Powering communications for when and where you need it



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Improve the speed & quality of decision being made' in your business by providing employees with everything they need to connect, communicate and collaborate with others from anyplace, at anytime

Today work is not always done at a desk. It's done in the car, or while walking to lunch, or even while waiting for the plane to board. It can include colleagues working from home, from different countries, or with those who are not part of the organization.

This is why enabling your business to connect and collaborate more easily and effectively, no matter where they are or how they choose to work - is more essential than ever.

Mitel® MiCollab simplifies the way employees talk, meet, and share information with others by bringing together essential communications and collaboration tools into a single solution.

Through a single application, your employees have access to an integrated suite of collaborative services that align with how employees prefer to connect with others in today's fast-paced, often mobile workplace so that they can make every interaction efficient and productive whether it's with colleagues, customers, or partners.

Key Benefits

- A single application for voice, video, messaging, presence, conferencing, mobility, and team collaboration
- Keep up with projects and boost the sharing of knowledge and ideas across business silos with integrated team collaboration services
- A communications experience that's consistent across desktop and mobile devices
- Flexible deployment options - on-site, virtualized, or private cloud - that can evolve with your business as needs change
- A connected workforce working together to increase the speed of interactions and satisfaction of customers
- Presence and communications connectivity within Outlook to streamline employee communications workflows

Supercharging business productivity

MiCollab brings together voice, video, chat, messaging, web conferencing and team collaboration tools into a single solution making it easier for employees to connect with others and break down the silos associated with organizational departments.

Whether it's from their desktop or mobile device, with MiCollab employees can easily share ideas and tap into the knowledge of others across the organization, no matter where they are located.

For example, employees can view the availability of colleagues who may have the answer to a time sensitive question and even though they are showing out of the office, they are still available via their mobile device using chat to provide the vital information that saves the day.

Furthermore, with team collaboration tools (MiTeam) integrated into MiCollab mobile and desktop clients, working together on project-related activities such as document reviews, tracking the completion of tasks, and participating in real-time meetings has never been easier.

Everything you need in one place

By providing essential communications and collaboration tools in a single, unified solution, Mitel MiCollab helps reduce the latency and complexity associated with having to sort through and locate communications that in the past were often be spread out across multiple modes of communication and business applications.

With MiCollab your employees can benefit from:

- *Unified Communications (UC) services that make connecting with others an intuitive, seamless experience*
- *Team Collaboration services (MiTeam) that enable virtual, collaborative workspaces for group-based projects of any size*
- *Unified Messaging (UM) services that make message retrieval and management simple*
- *Collaboration services (Audio, Web and Video Conferencing) to power scheduled or "in-the-moment" teamwork between colleagues, business partners, and customers*

MiCollab Client

Unified Communications

A single access point for all your communications and collaboration:

PRESENCE – know instantly whether people you need to connect with are on the phone, away from their desk or available for a chat

ONE-TO-ONE AND GROUP CHAT – instant message with others using Mitel's web-based* (resilient, persistent, and secure) chat services

VISUAL VOICEMAIL –quick access to voice messages with visual message handling and current presence information of the colleague who left the message

SOFTPHONE – enjoy the same desktop phone communications experience from a PC, laptop, or smartphone

MOBILITY – installed as a client on iOS® and Android™ devices to extend office-based communications and team collaboration capabilities to mobile users

WEB CLIENT – access unified communications and collaboration features from remote locations using only a web browser

POINT-TO-POINT VIDEO – place a video call to colleagues with the tap of a button

INTEGRATION WITH BUSINESS APPLICATIONS – streamline communications with integration to other business applications, such as Microsoft® Office®, Outlook®, and Google®

Team Collaboration (MiTeam)

Persistent, virtual workspaces for team conversations, content sharing, and meetings, with features including:

STREAMS – virtual workspaces where group members can discuss topics, share content, assign action items, and not have to search through multiple locations / applications to find the information they need

REVIEW – review shared content using a variety of annotation methods, including text, voice and video clip (MP4)

TASKS – assign and track action items to ensure team members understand what needs to be accomplished, who is responsible, and what date it's required by

MEET– create collaborative meetings on the fly, by choosing the participants, sending invitations, and launching the real-time meeting all from directly within the virtual workspace

Unified Messaging

Enables the management of voice mail, email and fax messages with features including:

MESSAGE RETRIEVAL – retrieve voice, text and fax messages from one synchronized message store

OUTLOOK® CLIENT PLUG-IN – install an additional toolbar within Outlook to manage voice messages

FAX SERVICES – pro-actively provide fax senders with transmission status information right in the email in-box

Audio, Web and Video Conferencing

Comprehensive audio conferencing and web collaboration capabilities with features including:

SCHEDULED / AD-HOC COLLABORATION – create a variety of collaboration sessions, ranging from one-time scheduled audio-only conferences to in-the-moment web collaboration escalation from within a call

PARTICIPANT MANAGEMENT – consolidated view of all audio-only and collaboration participants, with integrated moderator controls

DESKTOP AND APPLICATION SHARING – share the entire desktop, or only select applications, presentations, or files of every kind

MULTI-POINT VIDEO CONFERENCING – a personal face-to-face collaboration experience using ordinary webcams

PUBLIC AND PRIVATE CHAT – instant message with the option of archiving session transcripts

WEB-BASED COLLABORATION – participate in sessions using only a web browser (audio and sharing)

MEETING CENTER – integration with the Mitel MiVoice 6800/6900 series phones providing notification of MiCollab meetings for the day and one button access to join

CONFERENCE RECORDING – record conference calls or collaboration sessions for future access or distribution

REMOTE CONTROL – request control of another participants desktop for back and forth collaboration

OUTLOOK® CLIENT PLUG-IN – install an additional tab within Outlook for automatic conference creation when creating a meeting request

For more information, please visit www.mitel.com/products

* MiCollab's chat engine is powered by Mitel's CloudLink platform and built upon Amazon Web Services (AWS®) - the leading global cloud delivery framework

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630.350.0700
www.ask-tig.com

BR-461062-M1607-0919-EN

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About MiCollab Client

The MiCollab Client application provides a suite of advanced communication features and integrates with your enterprise's call manager to provide you full control of your communication experience. Whether you are in the office or away, MiCollab Client allows you consistent full-feature access to the MiCollab unified communications and collaboration environment on a variety of devices.

MiCollab Client is available on the following devices:

- MiCollab for PC Client—Windows 7 and Windows 10
- MiCollab MAC Desktop Client—Macintosh®
- MiCollab Web Client—Internet Explorer®, Google Chrome™, and Mozilla® Firefox®
- MiCollab for Mobile Client—Android® and iPhone™

MiCollab Client enables you to:

- Control your phone from your desktop—make calls, answer calls, and invoke mid-call features.
- Control your Dynamic Status to direct calls to wherever you are, at any time of the day.
- Chat with individuals and groups of contacts.
- Review your voicemails.
- Launch Audio, Web and Video conferences with contacts.

Note: This guide describes the installation and configuration steps, and the features that are available on MiCollab for PC Client, MiCollab MAC Client, and MiCollab Web Client. For details about MiCollab for Mobile Client, refer to *MiCollab for Mobile Client Quick Reference Guide*.

Getting Started

After your system administrator creates your MiCollab Client account, you will receive a welcome e-mail message that provides your MiCollab Client login credentials, Web Client URL, and other information. Retain this e-mail message in a secure location for future reference.

Deployment E-mail

You will also receive a deployment e-mail that contains instructions on authenticating your Client with the system. The deployment e-mail contains a link to start the deployment process, an authentication code, and an option to scan a QR code to deploy MiCollab Client.

Once authenticated, MiCollab Client allows you to log on to the system without entering your credentials.

What's New in This Release

For a list of new MiCollab functionality, see What's New in This Release on the Mitel Customer Documentation site.

Requirements

MiCollab Client	Requirements
MiCollab for PC Client	• CPU—Quad core, 2.0 GHz • Disk space—600 MB free hard disk space • RAM—8 GB or more recommended • Operating system—Windows 7 SP1 (32/64 bit) and Windows 10 (32/64 bit), Anniversary Update or later
MiCollab MAC Client	• CPU—Dual core, 1.6 GHz or higher • Disk space—100 MB free hard disk space • RAM—4 GB RAM or more recommended • Operating system—10.10 or later
MiCollab Web Client	• Operating system—Windows 7 SP1, Windows 8.0, 8.1 (Desktop mode), Windows 10, and MAC OS X Yosemite 10.10 or later • Web browser—Microsoft Edge 20, Internet Explorer (IE) 9, 10, and 11, Mozilla Firefox 40 or later, Google Chrome 45 or later, Apple Safari 9.0 or later

MiCollab for PC Client

MiCollab for PC Client is installed on your computer and provides full access to the MiCollab Client features that you are licensed to use.

Installing MiCollab for PC Client

Note: If you do not have permission to install MiCollab for PC Client on your computer, contact your system administrator.

1. Download MiCollab for PC Client install software as instructed in the deployment e-mail message.
2. To start the installation, launch the MiCollab for PC Client install software (MiCollab_PC.msi).
3. Follow the on-screen instructions to install MiCollab Client.
4. Click **Finish** to complete the installation.

When prompted for an authentication code, authenticate the Client as described in Authenticating MiCollab Client on page 3.

Note: MiCollab Client integrates with Microsoft Outlook to provide Instant Messaging (IM) services. That is, you can chat and call your Outlook Contacts directly from Outlook and make your MiCollab Presence visible to your Contacts within Outlook. For this feature to work, you must restart Outlook after installing and launching MiCollab Client.

Logging on to MiCollab for PC Client

After authenticating the MiCollab for PC Client, the system directly logs you on to MiCollab for PC Client.

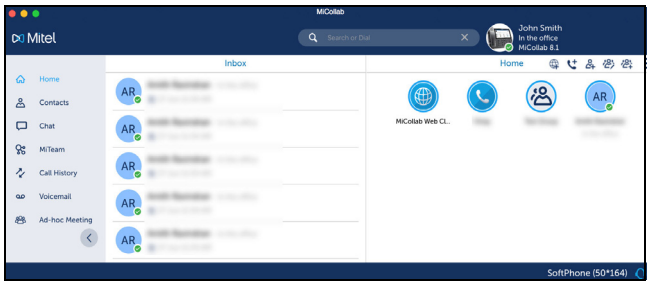
Logging off from MiCollab for PC Client

To log off from MiCollab for PC Client:

- Right-click the MiCollab Client icon in the windows taskbar and select **Quit MiCollab**.
- Click the Close icon ( ) or press Alt+F4 to minimize the Client to the system tray. Right-click and select **Quit MiCollab** from the system tray.

MiCollab MAC Client

MiCollab MAC Client is installed on your Macintosh computer and provides full access to the MiCollab Client features that you are licensed to use.



Installing MiCollab MAC Client

1. Go to App Store and search for MiCollab MAC Client.
2. Click **GET** and then select **INSTALL APP** to install MiCollab MAC Client.

When prompted for an authentication code, authenticate the Client as described in Authenticating MiCollab Client on page 3.

Logging on to MiCollab MAC Client

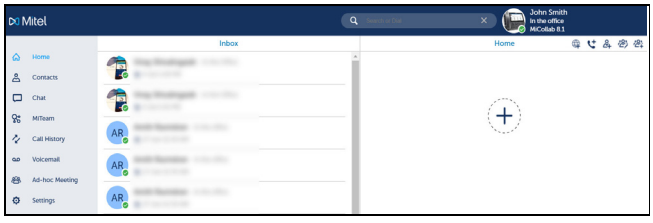
After authenticating the MiCollab MAC Client, the system directly logs you on to MiCollab MAC Client.

Logging off from MiCollab MAC Client

To log off from MiCollab MAC Client, click **Quit** from the main menu.

MiCollab Web Client

MiCollab Web Client provides access to several MiCollab Client features from a web browser.



Logging on to MiCollab Web Client

To log on to MiCollab Web Client, open a web browser and enter the URL provided in the welcome e-mail message. Type your login credentials on the login page and click **Login**.

> **Note:** It is recommended not to use MiCollab Web Client in private browsing mode. Some features of MiCollab Web Client might not work properly in this mode due to security reasons.

Selecting the softphone in Web Client

> **Note:** The code expires after 10 minutes. Click **Refresh** to regenerate the code.

If you have more than one softphone, you can select the preferred softphone from MiCollab Web Client under **Settings** > **General** > **WebRTC Credentials**.

Logging off from MiCollab Web Client

To log off from MiCollab Web Client, click the Close icon ( ) in the browser or press Alt+F4.

Authenticating MiCollab Client

To authenticate MiCollab Client (MiCollab for PC Client or MiCollab MAC Client), use one of the following methods:

- Click the link provided in the deployment e-mail message.
- Copy the authentication code provided in the deployment e-mail, open MiCollab Client, and type or paste the authentication code.

With MiCollab Client running in the background, log on to MiCollab Web Client using your credentials (provided in the welcome e-mail message). Click **Settings** > **General** > **Self Deployment**. Click the QR code to authenticate MiCollab Client. For more information on self-deploying MiCollab Client, see Self-Deployment on page 3.

Self-Deployment

You can self-deploy and configure the MiCollab for PC, MAC, and Mobile Client. You can deploy the account on another mobile device or desktop device without administrator assistance. The Mobile Client can be deployed from a MiCollab for PC Client, Web Client, MAC Client, or Mobile Client.

Self-deploying MiCollab for PC Client and MAC Client

To self-deploy MiCollab for PC Client or MAC Client from a Web Client:

1. Select **Settings** > **General** > **Self Deployment** on MiCollab Web Client.
2. A temporary QR code is generated on the Client and displayed on screen.

   Note: The code expires after 10 minutes. Click **Refresh** to regenerate the code.

3. If you have multiple extensions configured, the list of softphone extensions is available from the drop-down list on the **Self-Deployment** screen. Select the appropriate extension to be deployed.
4. Click the QR code generated in step 2. This initiates the configuration process on the MiCollab PC or MAC Client.

Note: MiCollab for PC Client or MAC Client must be already installed on your computer.

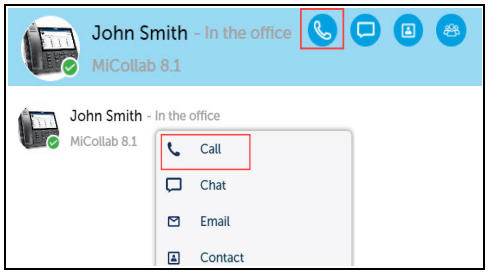
5. In the **License Agreement** screen, click **Accept**.

The MiCollab for PC Client or MAC Client is automatically deployed and configured.

Calls

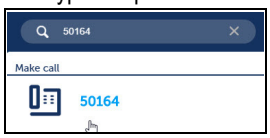
Place a call

In the contacts list, hover over or right-click the contact you want to call, and then select the Call icon.



If the contact is not in the Contact list:

1. Type the person's number in the search box.



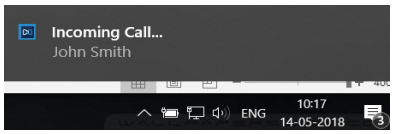
2. Select the number from the **Make call** list to make a call.

Note: To set a preferred device for outgoing calls, see Call Using on page 5.

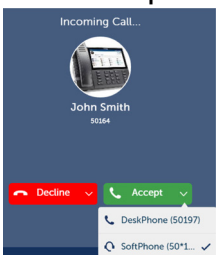
Answer an incoming call

When you receive a phone call from another MiCollab Client contact:

- If MiCollab Client is running in the background, a notification appears in the lower-right corner of your computer screen. Click the notification to open MiCollab Client.



- If MiCollab Client is running in the foreground, you can **Accept**, the call on **Softphone** or on **Deskphone**.



When an incoming call screen is displayed, you can accept the call, decline the call, or decline the call and send a chat message if the caller is also a MiCollab user.

Note: The answer button will display the selected preferred device. For example, if preferred device is selected as DeskPhone, an incoming call can only be answered on the DeskPhone.

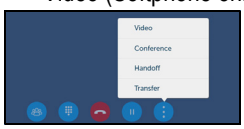
Note: While active on a MiCollab call, if there is a second MiCollab incoming call, the call screen displays the incoming caller ID and you hear a call waiting tone. You can accept or decline the call. The in-call features include hold, retrieve, end call, transfer, conference, and toggle options.

In-Call features

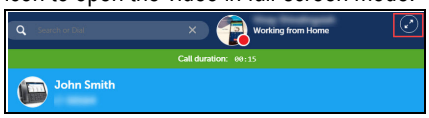
Using call control features

Call Control features are displayed in the Call window. Click any of the following features to access it:

- Ad-hoc Meeting
- Dialpad
- Conference
- Transfer (Supervised)
- Handoff
- Hold/Retrieve
- Hang-up
- Mute/unmute (Softphone only)
- Speaker (Softphone only)
- Video (Softphone only)



While active on a MiCollab video call (on softphone), click the  icon to open the video in full-screen mode.



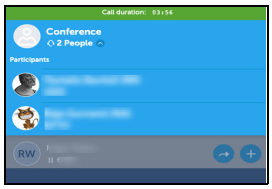
Note: To disable the in-call floater window, click **Settings** > **Call Settings** and set the **Show In Call Floater Window** toggle to **Off**.

When you minimize an active call or open other options in Client, the **In-Call** floating window opens. Double-click the floating window to return to the call.

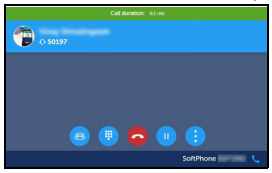
Note: To disable the in-call floater window, click **Settings** > **Call Settings** and set the **Show In Call Floater Window** toggle to **Off**.

When you are in an active call:

- you can hover over or right-click the contact ribbon to access chat and contact card options.
- you can chat with a contact or in a MiTeam stream. The **Chat** panel is displayed beside the Call panel if your MiCollab window is in maximized mode. If you resize the MiCollab window, only the Call panel is displayed. To chat with a contact or in a MiTeam stream, click the corresponding icon in the Views menu. The Call panel is minimized and the **Chat** panel is displayed. You can return to the Call panel by clicking the minimized Call panel displayed above the **Chat** panel.
- you can click **Transfer** to place another call. You can place either a **Consultation Call** or a **Blind Transfer**. If you place a **Consultation Call**, the new call becomes the active call and the previous call is put on hold. To retrieve the previous call, click the Hold/Retrieve icon. The previous call now becomes the active call. You can toggle between the calls by using this icon. If you place a **Blind Transfer**, you are disconnected from the active call. The call continues between the other participant of the active call and the new contact to which you made the Blind Transfer.
- you can click **Conference** and dial another contact. A conference call is created with the contacts in the call.



- the call duration is displayed above the contact ribbon.



Note: The call duration timer in the MiCollab for PC Client is not in synchronization with the call duration timer in a deskphone. The Client timer resets when there is a network interruption or if the Client is restarted. However, the Client timer does not reset when the Client is running in the background.

Audio routing (MiCollab for PC Client)

MiCollab for PC Client supports audio routing of voice and voicemail messages.

Audio routing of voice

MiCollab Client routes the in-call audio to the default communication device. For example, a connected headset. If there is no default communication device available, the audio will be played through the default device. For example, built-in computer speaker.

Note: The playback device type can be changed in the Windows, **Sounds** > **Playback device** settings.

You can choose whether the ringtone of an incoming call should be played through Default Device, Default Communication Device, or All Devices. From MiCollab for PC Client, click **Settings** > **Call Settings** > **Playback Ringtone/Ringback**.

Set the Recording device as **Default Communication Device** in the Windows sound settings, to the required recording device.

If the headset or bluetooth speakerphone is selected as the default communication device for in-call and playback ringtone, all the audio is routed to the selected device. If the device is unplugged from the computer, all the audio is routed to the selected default device.

Audio routing of voicemail

You can change playback voicemail device type to specify the selected device. From MiCollab for PC Client, click S**ettings** > **Voicemail Settings** > **Playback Voicemai**l.

Call Using

MiCollab Client enables you to specify the device used for outgoing calls. The **Call Using** field specifies the device used for outgoing calls. You can modify the setting to specify the default device for outgoing calls. Go to **Settings** > **Call Settings**.

The following options are available:

- **Managed by Status**—**Manage Status** option changes the outgoing device to be the preferred device selected in the Dynamic Status. Your default device for outgoing calls changes if you change the Dynamic Status.
- **Prompt**—If you want to manually choose a device before making a call.
- **Mobile**—The mobile device will always be used to make the call.
- **SoftPhone**—The softphone will always be used to make outgoing calls.
- **DeskPhone**—The deskphone will always be used to make outgoing calls.

Call Using in Dynamic Status

Default device to be used for outgoing or incoming calls can also be changed based on the selected Dynamic Status. To select a default device:

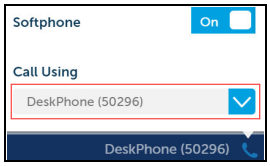
1. Open MiCollab Client.
2. Go to **Settings** > **Manage Status**.
3. Select the preferred status.
4. From the **Call Using** drop-down list, select the device you prefer to make calls from.

   Note: From the **Call Using** drop-down list, select **Prompt** to choose a device before making a call.

5. From the **Send my calls to** drop-down list, select **My Ring Group** and then select the device you prefer to answer calls from.
6. Click **Done**.

Call Using in the Client's footer

You can select the default device to manually override the preferred device from the MiCollab Client's footer.



Note: This setting will remain until you change the device by applying a new Dynamic Status.

Note: Softphone toggle only registers the softphone and does not register the Client with the credentials of the controlled device visible in the lower right corner.

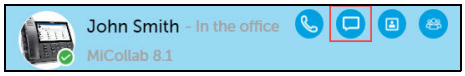
Chat

Chat

The Chat feature allows you to connect in real time to any other MiCollab contact or group of contacts. The chat view displays all existing chats on the left-half of the screen and the selected chat thread on the right-half of the screen. All chats received by the current Client are displayed here until they are deleted.

To initiate a chat with a contact:

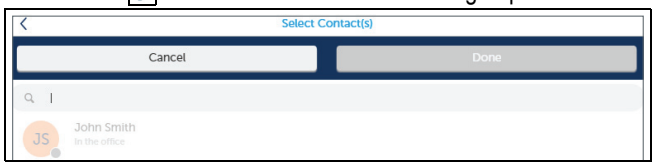
1. Hover over the contact or right-click the contact, and select the **Chat** icon.



2. In the text area, type a message. You can also copy and paste a message from existing chats.
3. Press **Enter** or click **Send**.

To initiate group chat from an individual chat:

1. Open the individual chat.
2. Click the ⋮ icon and add the contacts for the group chat session.



3. Click **Done** to start the group chat session.

Note: MiCollab chat notification sound can be set in the Windows sounds settings. Navigate to **Hardware and Sound** > **Sound** > **Sounds** and select your desired chat notification sound under **MiCollab Client Sounds**.

Note: If you launch a new MiCollab Client when a chat is already in progress on another Client, the chat interactions will not be visible on the new Client as the chat session is already bundled to the previous client. For a new chat session initiated from the new Client, incoming messages will be visible on both Clients while outgoing messages will be visible only on the Client from which the messages are sent.

Meeting

Ad-hoc Meeting

This function allows you to launch an Ad-hoc Meeting with any of your contacts (with e-mail id). An Ad-hoc Meeting is an instant MiCollab AWV Conference created on all MiCollab Desktop Clients (MiCollab for PC Client, MiCollab MAC Client, and MiCollab Web Client). The meeting initiator must have MiCollab AWV service.

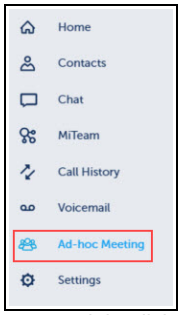
Note: Users on MiCollab for Mobile Client (Android and iOS) cannot create an ad-hoc meeting. If invited, users will be able to join the meeting on MiCollab for Mobile Client as participants only.

Note: Ad-hoc escalation options are displayed depending on the MiCollab server configuration.

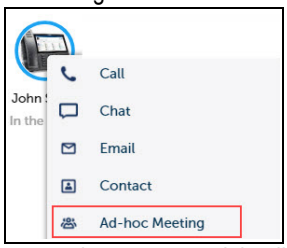
The conference initiator can create an instant MiCollab AWV Conference and add participants.

To create an Ad-hoc Meeting:

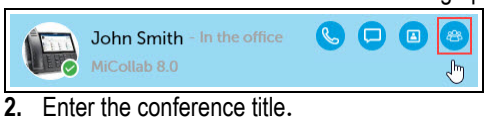
1. Open MiCollab Desktop Client and select Ad-hoc Meeting from the following options:
   - select **Ad-hoc Meeting** from the main view.



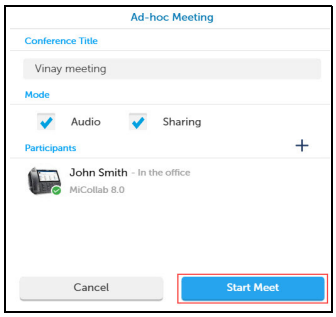
   - right-click on the contact and select **Ad-hoc Meeting**.



   - hover over or right-click the contact from inbox, home shortcuts, **Contacts** menu, contact card, call history, and voicemail to select the ad-hoc meeting option.



2. Enter the conference title.



Note: By default, the conference title is your **first name** appended with **meeting**. For example, **John meeting**.

3. Select the mode of the meeting, **Audio**, **Sharing**, or both.
   - If only **Sharing** is selected, a new browser page will open with the initiator logged on to the conference as a leader.

     Note: Meeting invitation will only have Conference URL. Audio is disabled for the **Sharing** only conference.

   - If only **Audio** is selected, user will get an option to either dial-in or get a call back to the ad-hoc meeting to join the audio portion of the meeting.

     Note: Meeting invitation will only have audio dial-in number details. Web sharing is disabled for **Audio** only conference.

   - If both **Audio** and **Sharing** modes are selected, users will get an option to either dial-in or get a call back to join the audio portion of the ad-hoc meeting.

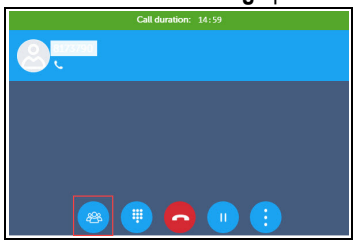
4. To add participants to the meeting:
   a. Click **Participants** (+).
   b. In the search box, enter the name of the participant to invite to the meeting.
   c. From the search results, select the participant name.
   d. Click **Done** after adding each of the participants.
5. Click **Start Meeting** to initiate the ad-hoc meeting.

Invited participants (internal and external) will receive an e-mail that contains the Conference URL and audio dial-in number details.

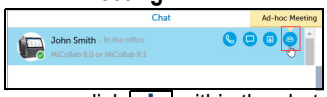
Note: Non-MiCollab participants are not displayed in an ad-hoc meeting.

You can now escalate an audio call or a chat to an ad-hoc meeting.

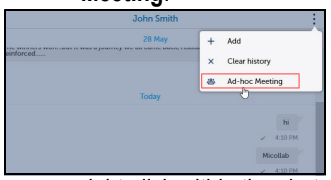
1. Click **Ad-Hoc Meeting** icon,
   - From an ongoing MiCollab call (individual or conference call), click **Ad-hoc Meeting** option.



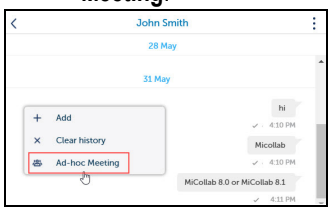
   - From a chat conversation (individual or group chat),
     - hover over the contact from chat window and select **Ad-hoc Meeting**.



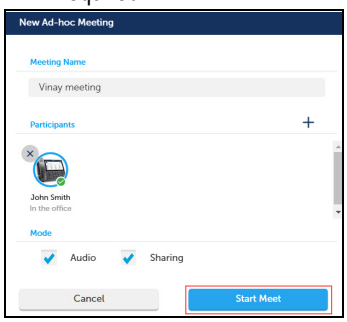
     - click ⋮ within the chat session and select **Ad-hoc Meeting**.



     - right-click within the chat session and select **Ad-hoc Meeting**.



2. A pop-up is opened which allows user to add meeting details and participants for the meeting. Add participants to the meeting if required.



Note: If the meeting is created by call escalation, **Audio** mode is disabled. If the meeting is created by chat escalation, both **Audio** and **Sharing** modes are selected by default.

Click **Start Meeting** to initiate the ad-hoc meeting.To join the ad-hoc meeting:

- **Leader**: When the initiator clicks **Start Meeting**, the MiCollab AWV Conference Web Client opens. The initiator is automatically logged on to the conference as the leader.
- **Participants**: Click the conference URL from the e-mail invitation to open the conference Join webpage in the browser. Enter your name and click **Join** to join the conference using the MiCollab AWV Web Client. Alternatively, click **Join via Windows Client** to use the MiCollab AWV Conferencing Desktop Client.

Note: The conference Join webpage opens in the default system browser.

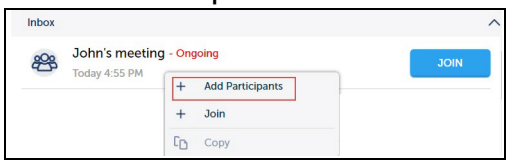
If you are using MiCollab Client 8.1 and above, you will get real-time meeting invitation (inbox notification) on the Client. Click **Join** to join the MiCollab AWV Conference.

The inbox notification will be automatically removed:

- after two hours of the meeting start time.
- within 15 minutes if all the participants are logged out of MiCollab AWV Web Client. This is valid even if only one participant joins the conference and logs out.

The leader has the option to add new participants to an ongoing ad-hoc meeting. To add participants to an ongoing ad-hoc meeting:

1. Right-click on an ongoing ad-hoc meeting from the inbox notification.
2. Click **Add Participants**.



3. Click **Participants** (+).
   a. In the search box, enter the name of the participant or enter the e-mail id to send an ad-hoc invitation to the users.
   b. From the search results, select the participant name.
   c. Click **Add** after selecting the participants.
4. Click **Update** to add the participants to the ongoing ad-hoc meeting.

Note: Non-MiCollab participants are not displayed in an ad-hoc meeting.

MiTeam Meet

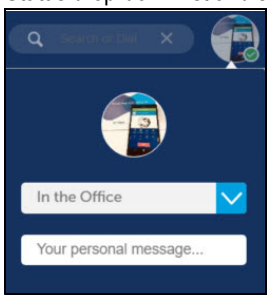
MiTeam provides a persistent workspace for team-based conversations, content collaboration, project management, and meetings.

Using the MiTeam Meet capability in your MiCollab Client (PC, MAC, and Web Client), you can share applications or screens to collaborate with other MiCollab or guest users in the meeting.

See *MiTeam Quick Reference Guide* for more information on MiTeam Meet. MiTeam is a licensed feature within MiCollab. Contact your system administrator to know more about configuring MiTeam.

Dynamic Status

The Dynamic Status view indicates your current Presence and Dynamic Status. To change the Dynamic Status, click the Dynamic Status drop-down list and select the preferred status.



To add a new Dynamic Status:

1. Open the MiCollab Client and click the avatar.
2. Click the dynamic status drop-down list and select **Manage Status**.
3. Click ⋮ (More menu) and select **New**.
4. Enter the status name and required fields and click **Done**.

Right-click the avatar to change your picture. You can browse for a new picture to add, or to replace an existing picture, or remove an existing picture.

Types of Presence

The Presence indicator provides contacts' status and their presence and availability for voice and chat functions.

Circles indicate that a contact is available for chat and the phone icons indicate that only contact's voice presence is known.

	Available for chat and calls.
	Away or currently not in front of PC. Available for chat and calls, but may not answer.
	* **In a Meeting** or on the phone. Available for chat, but answers may be delayed.
	* * **Do Not Disturb**: The contact is not available. Calls are forwarded to voicemail. Chats may be sent and received.

	Available for calls, but not available for chat.
	Phone is busy for calls or the contact is in a meeting, and not available for chat.
	* Calendar setting is **Out of Office**. Available for chat and the phone is free.
	* Calendar setting is **Out of Office**. Available for chat and the phone is busy.
	* Calendar setting is **Out of Office**. Not available for chat and the phone is free.
	* Calendar setting is **Out of Office**. Not available for chat and the phone is busy.
	Offline: Not available for chat or calls.

* Calendar Integration must be enabled.

* * The Do Not Disturb behavior for your MiCollab Client depends on the call manager configured. For more information, see the respective call manager documentation.

Outlook contacts IM Presence (MiCollab for PC Client)

	Available for chat and calls.
	Away or currently not using PC. Available for chat and calls, but may not answer.
	Busy or on the phone. Available for chat, but answers may be delayed.
	Do Not Disturb: The contact is not available. Chats can be sent, but calls are forwarded to voicemail.
	Offline: Not available for chat or calls. The contact has logged off from the MiCollab Client.
	Presence unknown: The contact is not available in the MiCollab Corporate Directory.

To integrate Outlook with MiCollab, MiCollab for PC Client must be started before starting Outlook. You can configure MiCollab for PC Client to automatically start when Windows starts.

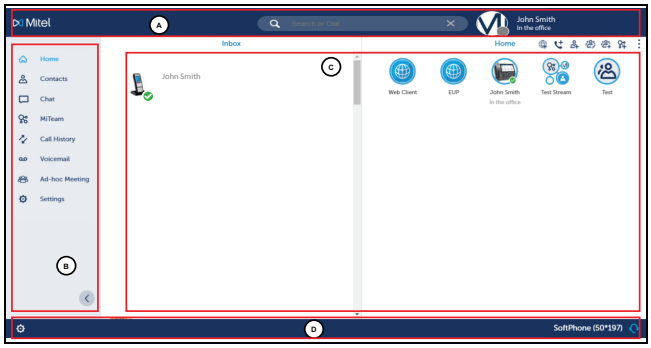
Starting up MiCollab for PC Client on Windows start

You can specify the settings to automatically start the MiCollab Client when Windows starts. To manage the settings:

1. Click **Settings** and select **General**.
2. Turn **On** the **Start the MiCollab Client on PC Start** setting.

MiCollab Client Overview

There are four main sections in MiCollab Client main window.



A. **Header**—Displays your personal information, presence status, and a search bar.
B. **Views menu**—Displays the basic Client navigation menu for MiCollab. Only the features you are licensed to use are displayed.
C. **Display**—Displays information related to the menu function selected in the **Views** menu.
D. **Footer**—Displays your phone status and preferred device for outgoing calls.

Header

The Header section comprises two important functions:

- Dynamic Status—Using Dynamic Status, you can control how others can contact you.
- Search—Allows you to search for contacts in any part of the Client or enter phone numbers to directly start dialing.

Views Menu

Home

The home page is a convenient location for storing frequently used contacts, contact groups, website addresses, personal speed dials, and MiTeam Streams.

Click the action icons at the top of the home page or right-click anywhere in the empty space on the home page for options to store these details.

Add URL: Use to add a URL for launching a web browser.

Add Speed Dial: Use to add a number for speed dial.

Add Contact: Use to add a corporate contact.

Note: You cannot add personal contacts to the home page.

New Group: Use to create a new group and adding it to the home screen for easy access.

Add Group: Use to add an existing group to the home screen for easy access.

Add Stream: Use to add an existing MiTeam Stream to the home screen for easy access.

The (More menu) allows users to go into edit mode. Click **Edit** to reorder or delete items from the home page. A user can also enter edit mode by dragging an item on the home page.

Contacts

The **Contacts** page provides access to all groups, personal contacts, and corporate contacts. Right-click on the contact or hover over the contact to view the communication options.

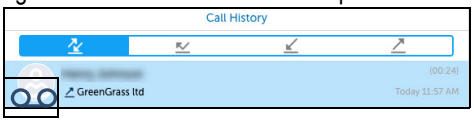
Note: When you click **Email**, the default e-mail application in your system opens.

To search for a contact, type a name or number in the search bar in the header area.

To import personal contacts, click **Settings** > **General** > **Personal Contacts**. Select the applications from which your contacts must be imported.

Call History

This function provides a listing of all your dialed, received, and missed calls. To call any entry in the call history view, hover over or right-click the contact to select the phone icon.



Allows you to play and to delete voicemail messages. You can also forward the voicemails in an email. While playing the message, you can advance or rewind the message by dragging the tracker accordingly.

Settings

You can manage the following settings:

General	Allows you to change password, set the time format, send or delete diagnostic logs, and use Factory Reset.
Voicemail Settings	Allows you to change the mailbox PIN.
Call Settings	Allows you to set the calling mode.
Manage Status	Allows you to change, add, edit, and delete Dynamic Status.
Calendar Integration	Provides automatic updates to your Dynamic Status based on your Google Calendar, Microsoft Exchange, Outlook, or Lotus Notes calendar entries.
Schedules	Allows you to manage your schedules and your Dynamic Status is updated accordingly.
About	Provides information about the End User License Agreement, and the MiCollab Client-MiCollab Server versions.

Display

The Display area is the main information display for the MiCollab for PC Client. In full screen mode, the left side of the screen provides the full list of the selected topic such as Chat, Call History, and so on. The right side of the screen displays the detail for the item selected on the left side, such as a chat thread or a contact card.

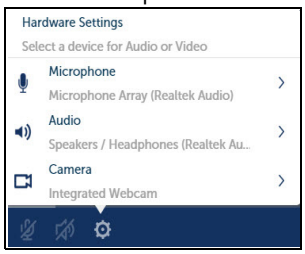
Footer

The Footer area provides phone status and hardware settings. Your administrator may have provisioned several (up to 8) devices for you. A typical setup includes a deskphone, a mobile, and a softphone. Your deskphone typically indicates your primary number. The other phones are twinned to your deskphone. Incoming calls are routed to all phones as determined by your Dynamic Status settings.

Hardware Settings

Click icon in the footer to change the hardware selection settings such as microphone, audio device, video camera for MiCollab calls. To change your hardware settings:

1. Open MiCollab for PC Client.
2. Click in the lower left corner of the Client.
3. From the devices list, hover over the device to be changed and select the preferred device to use for the MiCollab call.



Note: Video devices can be selected before and during a MiCollab call. The audio device selection setting is available only during a MiCollab call.

Note: A video device that is selected before a MiCollab call will be treated as the default video device (even if the Client is restarted) until the device is removed.

Note: After a MiCollab call, the audio devices will be reset to default devices as selected in your PC's system settings, and the video device will be reset to the default chosen outside of a call.

Softphone

Click the phone icon in the footer to view the status of your Softphone. If your system administrator provisioned a softphone for you, you can activate your softphone. To activate your softphone:

1. Open MiCollab for PC Client.
2. Click or in the lower right corner of the Client.
3. Under **Softphone**, click the toggle button to **On** to enable the softphone.

Note: The toggle registers the configured softphone with the Call Manager.

If you have multiple playback devices connected to your PC, make sure that the preferred audio device is selected as the default playback device in your PC's system settings. To select the default speaker, right-click the speaker icon on the PC's taskbar and select Playback Devices. Select the preferred device and click **OK**.

Calendar integration

MiCollab for PC Client provides integration with your Microsoft Exchange calendar if supported by your organization. When enabled, you can change your status based on events in your calendar.

For example, when you are in a meeting, you may want your Dynamic Status set as **In a Meeting**. Alternatively, you can have your calendar advisory display that you are in a meeting, while your Dynamic Status remains **In the Office**. This will ensure that your incoming calls continue to be routed to your **In the Office** locations.

Using chat options

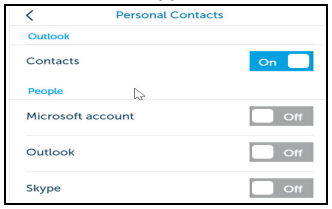
MiCollab for PC Client provides integration with Microsoft Office. From MiCollab for PC Client, navigate to **General** > **Chat Options** and turn **On** the toggle **Register as default IM provider** to display contacts' presence on their Outlook avatar.

Select the IM or Chat function in Outlook to take you directly to a contact's chat thread in the MiCollab Client.

Contact integration

MiCollab for PC Client provides the functionality to integrate personal contacts from other applications. To add contacts to your **Personal Contacts** list:

1. Click **Settings** > **General** > **Personal Contacts**.
2. Select the applications from which to add contacts.



The applications supported are:

- Outlook (2013 and 2016)
- Built-in Windows People (Windows 8.1 and Windows 10 only)

MiCollab for PC Client allows you to import only address books or selected groups of contacts from Outlook and the People application. This prevents contacts from being imported multiple times. If you do not want to import certain groups into the MiCollab Client, set the associated toggle to **Off**. Exit the **Settings** menu to apply the changes.

Note: MiCollab for PC Client can access Microsoft Outlook contacts only if the profile and the related Outlook data files (like **.pst* files) are stored on the same computer.

Note: By default, Outlook contacts are imported. If Outlook is not installed, the Client accesses available contacts from the Windows People application.

Note: When you add or edit a contact in Outlook, you must restart MiCollab for PC Client for the same contact to reflect in the client.

Managing hotkeys

MiCollab for PC Client enables you to use a combination of keystrokes for direct access to a particular function. To see the available hotkey functions, click **Settings** > **General** > **Manage Hotkeys**.

Note: Make a call hotkey function is not available in MiCollab MAC Client.

Supported headsets and audio devices

MiCollab Client supports headsets and external audio devices for audio routing. The supported features include:

- Accept/end call
- Mute/unmute call
- Volume control
- Hold/retrieve call (Not supported on MiCollab Web Client)

Note: To use call control features on headsets and external audio devices, install appropriate supplementary softwares of the compatible headsets.

Follow the configuration steps to use the headsets and speaker phone based on the audio device.

Mitel S720 Bluetooth Speakerphone

Use a USB cable or the special USB-Bluetooth dongle provided as a purchasable item to connect Mitel S720 Bluetooth Speakerphone to support audio features.

Note: On MiCollab Web Client, Mitel S720 Bluetooth Speakerphone does not support the hold and retrieve call feature.

On MiCollab Web Client, built-in speakers are selected for audio output by default. To get audio on Mitel S720 Bluetooth Speakerphone:

1. Disable the built-in speakers in Windows sound settings.
2. Set the headset / S720 as the default audio device.

See *Mitel S720 Bluetooth Speakerphone Quick Start Guide* for more information on setting up the Mitel S720 Bluetooth Speakerphone.

Jabra

To use a Jabra audio device (headset or speaker phone) with MiCollab Web Client:

Install **JabraChromeHost** software on your computer and then install **Jabra Browser Integration Extension** in Google Chrome web browser.

Note: On MiCollab Web Client, call control features on Jabra headsets or audio devices are not currently supported on other browsers like Microsoft Edge, Internet Explorer, Mozilla Firefox, or Apple Safari.

No additional software is required to use Jabra headsets with MiCollab for PC Client and MiCollab MAC Desktop Client.

Plantronics

To use a Plantronics audio device (headset or speaker phone) with MiCollab for PC Client, MiCollab MAC Desktop Client, and MiCollab Web Client, install **Plantronics Hub** software on your computer. See www.plantronics.com to download this software.

Note: On MiCollab Web Client, call control features on Plantronics headsets or audio devices are not currently supported on other browsers like Microsoft Edge, Internet Explorer, or Apple Safari.

Sennheiser

To use a Sennheiser audio device (such as headset or speaker phone) with MiCollab for PC Client, MiCollab MAC Desktop Client, and MiCollab Web Client, install **Sennheiser HeadSetup** software on your computer. See www.sennheiser.com to download this software.

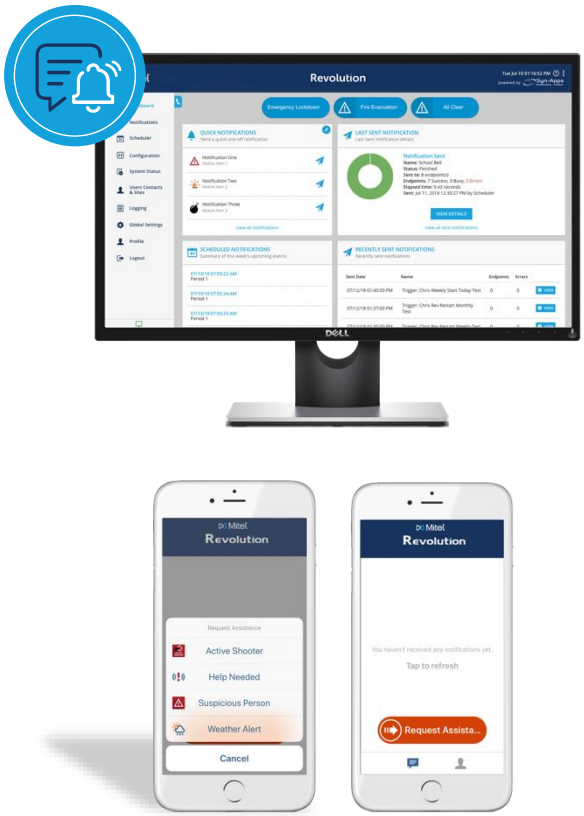
Note: On MiCollab Web Client, call control features on Sennheiser headsets or audio devices are not currently supported on other browsers like Microsoft Edge, Internet Explorer, or Apple Safari.

Mitel Revolution

Notifying the right people when it matters most

Key Features

- Media-rich notifications to on and off-premise devices
- Support 22,000+ endpoints
- Geo-fencing for targeted location-based alerts
- Activate alerts directly from iOS or Android mobile application
- Desktop Override option prevents users from closing alerts until the event is terminated
- Unicast to multicast technology removes the need to deploy multicast servers throughout the entire network
- Integrations to external CAP-enabled feeds, such as National Weather Service and AMBER Alert
- Real-time notification status, analytics and system health reports
- Extend beyond out-of-the-box integrations with built-in REST & Device APIs, plus Mitel CloudLink



Keep everyone informed and safe during critical events with real-time notifications

Whether you need to alert one individual or thousands of people, Mitel Revolution can help your organization overcome notification and communication challenges during critical events.

Mitel Revolution is built for quick and reliable mass notification in the modern mobile-centric world. With support for initiating alerts to on-premise, off-premise and mobile devices through emergency, pre-set, or location-based triggers, Mitel Revolution ensures that everyone will be notified, whether they are in the office or on the move. Built upon a fault-tolerant and adaptable architecture, Mitel Revolution can be tailored to address your critical or routine notification needs. Unicast to multicast technology removes the need for network multicast servers to make deployment simple and cost-effective.

Analytics gives administrators quick access to insight into the health of your system, enabling corrective actions to be taken immediately, if required.

Mitel
Powering connections

Technical Specifications

LANGUAGE SUPPORT

Client user interfaces (UIs) are supported in English. Actual messages to users can be in any language entered in free text fields.

Text-to-speech engine: Microsoft's TTS engine supports over 20 languages (including Chinese (Simplified & Traditional), Dutch, English (North American & UK), French (Canadian & European), German, Spanish (Latin American & European), and Swedish.

SYSTEM REQUIREMENTS

Supported Server OS	Windows 2012, 2012 R2, 2016, and 2019
Minimum System Requirements	Dual Core Processor; 4 GB RAM; 10 GB free disk space
Supported Virtual Machines	VMware ESXi 5.5 (or newer) or Microsoft Hyper-V 2012 and above

SUPPORTED SYSTEMS / DEVICES

Mitel Communications Platforms	MiVoice Business, MiVoice Connect, MiVoice Office 250, MiVoice MX-ONE
Desktop Phones	Mitel 6900 series, Mitel 5300 series, Mitel 6800 series, Mitel IP400 series, IP655, IP565g, IP560g, and SIP-compliant phones
Mobile Devices	Mitel Revolution mobile app for Apple iOS and Android-based OS devices including Chromebooks
Desktop PCs	Windows and Mac OS devices

SUPPORTED NOTIFICATION TRIGGERS

Devices & Technologies	Activate notifications from third-party devices such as Paging Relays, Contact Closures (GPIOs), Fire Alarm Panels, Access Control Systems, Smart Panic Buttons, API-based integrations and more
IP Phones	Trigger notifications from any Mitel or SIP-enabled phone on the network Trigger notifications by dialing an emergency number or any defined line number – Internally or externally
Common Alert Protocol (CAP) Alerts	Automatically trigger notifications from National Weather Service (NWS), Integrated Public Alert & Warning System (IPAWS EAS), AMBER Alert, or any other CAP-enabled feed
Mitel Revolution Mobile Client	Administrators can activate alerts directly from their iOS or Android Revolution Mobile Client app
Mitel Revolution Web Admin Client	Activate alerts directly from Revolution's web administration interface portal
Mitel Revolution Scheduler	Create notifications in advance with Revolution's Scheduler tool

SUPPORTED NOTIFICATION ENDPOINTS

IP Devices	Notify via third-party IP devices like Speakers, Clocks, Strobes & Beacons, LED Displays & Digital Signs, Paging Relays, Mobile Radios, Internal or External Numbers, Access Control Systems, and more Compatible with most IP devices that support multicast
IP Phones	Audio/visual alerts including paging and text displays to supported Mitel IP phones and SIP phones
Mobile Devices	Deliver multi-media push notifications to the Mitel Revolution mobile app Focus alerts based upon location and proximity to an incident zone using Geo-fencing capability
Desktop Devices	Alert with pop-up notifications delivered to PC & Mac desktop computers with a Desktop Override option to prevent their closing until event has been terminated
SMS Services	Connect third-party Clickatell or Twilio SMS services to simultaneously send traditional SMS text alerts to recipients
Outbound Mass Dialing Services	Connect to third-party Twilio outbound mass dialing service for Text-to-Speech (TTS) or prerecorded audio
Email Services	Send alerts to email recipients using SMTP with authentication
Common Alert Protocol (CAP) Enabled Devices	Send to third-party digital signs, radios, and other CAP-enabled feeds
LED Signs	Send to third-party devices from IP Device Notifier and Advanced Network Devices
Other	Send notifications to non-XML enabled devices configured to listen to a static stream, like beacons & IP phones. Send audio to third-party Analog-based paging systems

Mitel
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MITEL PLATFORM

	MiVoice Business	MiVoice Connect	MiVoice Office 250	MX-ONE
Supported Releases	Release 7.2 SP2 or higher	Release 1711 or higher	Release 6.3 SP4 or higher	Release 7.2 SP1 or higher
Supported IP Phones	Mitel 5300 and 6900 series phones	Mitel IP400 series IP655, IP565g, IP560g, and 6900 series phones	Mitel 5300 and 6900 series phones	Mitel 6800 and 6900 series phones

MITEL REVOLUTION+

Mitel Revolution Notification Capabilities	MiVoice Business	MiVoice Connect	MiVoice Office 250	MiVoice MX-ONE
Automatic Trigger: Common Alert Protocol (CAP)	Yes	Yes	Yes	Yes
Automatic Trigger: Scheduled Events	Yes	Yes	Yes	Yes
Automatic Emergency Call Trigger: SNMP Traps / Dial Monitor* / Email**	Yes	Yes*	Yes**	Yes
Manual Trigger: via REST API	Yes	Yes	Yes	Yes
Manual Trigger: Contact Closures	Yes	Yes	Yes	Yes
Manual Trigger: Request from Slack or Microsoft Teams	Yes	Yes	Yes	Yes
Manual Trigger: Mitel Revolution Mobile App	Yes	Yes	Yes	Yes
Manual Trigger: Mitel Revolution Web Portal	Yes	Yes	Yes	Yes
Manual Trigger: via SIP Dialing	Yes	Yes	Yes	Yes
Manual Trigger: Third-party Triggers & PoE Panic Buttons	Yes	Yes	Yes	Yes
Notifications: Desktop Notification	Yes	Yes	Yes	Yes
Notifications: Email Notification	Yes	Yes	Yes	Yes
Notifications: Mobile App Alerts	Yes	Yes	Yes	Yes
Notifications: Multicast Paging	Mitel 6900 series phones only (MiVoice Business R9.1 or higher)	Mitel IP400 series IP655, IP565g, IP560g and 6900 series phones	Mitel 6900 series phones in SIP mode only	Mitel 6800 and 6900 series phones
Notifications: Outbound Calling	Yes	Yes	Yes	Yes
Notifications: Overhead Paging (IP & Analog)	Yes	Yes	Yes	Yes
Notifications: Single Group Page	Mitel 5300 and 6900 series phones (Limit of 64 devices/page)	Mitel IP400 series IP655, IP565g, IP560g, and 6900 series phones	Mitel 5300 series phones	No (Use Paging Relay)
Notifications: SMS Alerts	Yes	Yes	Yes	Yes
Notifications: Third-party Systems (School Bells, Strobes, etc.)	Yes	Yes	Yes	Yes
Notifications: Unlimited Notification Groups	Yes	Yes	Yes	Yes
Notifications: Visual Alert on Phone Display	Yes (For MiNET Requires R9.1 or higher & 6900 series)	Yes	No	Yes
Notifications: Audio Alert on Phone Display	Yes (SIP only, 1-way)	Yes (1-way on 6900 series)	No	Yes (1-way on 6800 & 6900)
Notifications: Emergency Call Notification with Location Delivery	Yes	Yes	Yes (no location delivery)	Yes

+ See platform-specific Mitel Revolution Configuration Guides here for more detail regarding feature support and limitations.

DS-763606-R2001-EN

Mitel MiVoice Business Controllers

Purpose Built Hardware Designed to Address a Variety of Business Needs

Mitel
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Telcom Innovations Group
630.350.0700
www.ask-tig.com

When it comes to your communications solution MiVoice Business is a leading Voice over IP (VoIP) solution that is available to be deployed on industry standard servers and hypervisors. Sometimes, however, our customers need to provide support for more than just the latest in VoIP technologies.

This could entail support for analog trunks for emergency purposes or analog fax machines for the business. Or legacy types of trunks such as Primary Rate and Basic Rate ISDN.

Mitel Controllers are hardware platforms that are specifically designed for MiVoice Business to be deployed on that deliver not only as a feature VoIP solution, but also incorporate gateway functionality for non IP telephony technologies.

The controller and MiVoice Business together provide your business with a complete communications solution that provides voice communications, unified messaging, auto-attendant, digital and analog trunking, and support for analog devices, such as fax machines - all in a single package.

Another aspect of the Mitel 3300 Controller is that it can be deployed as a dedicated media gateway, providing your business with a "gateway" to productivity enhancing solutions, like unified messaging and mobile integration - all without having to remove your existing communications system.

Mitel 3300 Controllers are available in several variants - CX II, MXe III-L, EX and AX - with each offering unique capabilities to address a wide range of business needs.

And if a customer's requirements exceed the specifications of a single controller then another, of any variant, can be added and clustered together to create a larger feature transparent solution.

Mitel Controllers

Specification	CX II	MXe III-L Standard	MXe III-L Expanded	AX	EX
Maximum number of devices (including softphones and Contact Center agents)[1]	150	350	1,500	400 [1,2]	1,500
Maximum number of IP phones[1]	150	300	1,400	125 [1,2]	1,400
Maximum number of SIP devices / users	150	300	1,000	100	1,000
Maximum ACD Agents[1]	50	100	150	50	150
Maximum MiVoice Business Consoles	8	16	24	8	24
Maximum Number of Analog devices	150	350	576	288	28
Main Software Storage Media	32 GB SATA Solid State Drive	64 GB Solid State Drive (optional RAID)	64 GB Solid State Drive (optional RAID)	16 GB Flash Card	60 GB or 120 GB integrated SSD storage
Installed RAM	1 GB	1 GB	1 GB	512 MB	4 GB or 8 GB
Available Module Slots	3	6	5	2	8
Module Slots for	Quad CIM Single T1/E1 Quad BRI DSP II	Quad CIM Single and Dual T1/E1 Quad BRI DSP II Echo Canceller	Quad CIM Single and Dual T1/E1 Quad BRI DSP II Echo Canceller	Single and Dual T1/E1 Quad BRI DSP II Echo Canceller	4-port FXS 4-port FXO DSP card T1/E1 PRI/R2

Mitel Controllers (continued)

Specification	CX II	MXe III Standard	MXe III Expanded	AX	EX
10/100/1000 MB Ethernet ports	1 x 10/100	2 x 10/100	2 x 10/100	2 x 10/100 only	5 x 10/100/1000
Maximum DSP Modules	1	1	2	1	1
Maximum Echo Canceller Channels	96	64	192	128	240
Maximum G.729a compression channels	64	128	192	128	240
Maximum T.38 channels	8	32	32	32	Non-blocking
Maximum number of digital links (except BRI)	2	8	8	2	8
Maximum BRI interfaces (2 x B channels per interface)	8	12	12	4	Not supported
Internal Analog Main Board[4,5]	6 x LS trunks, 4 x ONS ports	6 x LS trunks, 4 x ONS ports	6 x LS trunks, 4 x ONS ports	0	Not applicable
Internal Analog Option Board[4,5]	6 LS trunks, 4 ONS ports	0	0	0	Not applicable
Internal Analog Line card slots[6]	Provided by Analog Services Unit	Provided by Analog Services Unit	Provided by Analog Services Unit	12	7 (with DSP module fitted in slot 8)
Maximum number of CIM connected Analog Services Units (ASU)	3	12	12	0	0
Tone generators	128	128	128	128	128
Tone detector circuits	32	32	32	32	32
Gateway Channels (E2T)	64	64	128[7]	128	64 (PRI/Analog Interfaces are non-blocking)
DTMF Receivers	128	128	192	128	128
IP Networking – max IP trunks between MiVoice Business systems	2000	2000	2000	2000	2000
SIP Trunking – total maximum SIP trunks	2000	2000	2000	2000	2000
SIP Trunking – max SIP trunks between peers	2000	2000	2000	2000	2000
Maximum controllers in a cluster[8]	999	999	999	999	999
STP and RSTP	No	No	No	Yes	No

Voice Mail Specifications

Specification	CX II	MXe III Standard	MXe III Expanded	AX	EX
Embedded voice mail ports as standard	16	20	20	20	24
Maximum embedded Voice mail ports	16	30	30	20	24
Maximum mailboxes[9]	750	750	750	750	750
Storage hours	450 (130 with backup)	450 (130 with backup)	450 (130 with backup)	130 (30 with backup)	450 (130 with backup)
Maximum messages per mailbox	100	100	100	100	100

[1]Engineering rules apply.

[2]For low traffic solutions, like Hospitality systems, up to a maximum of 576 devices will be supported, 288 analog devices and up to 288 IP devices. For systems of this size please refer to Mitel system engineering.

[3]The Maximum Analog device limit is a nominal figure that depends on the Hardware used to connect the Analog devices. Options include the AMB/AOB and ASU II.

[4]Includes Music-on-Hold (1 source supported), Paging (1 paging zone), System Fail Transfer (2 circuits).

[5]Analog trunks support CLASS Signaling for North America and Latin America, ETSI Class for international markets. Onboard analog trunks are not supported in Malaysia.

[6]The Analog Line card is available in two variants; the 24 ONS circuit card and the 4 LS trunks and 12 ONS extension card. Note the 4+12 Card supports 4 SFT circuits.

[7]Supports up to 192 ET2 channels when being used in a Trunking Gateway configuration.

[8]Up to 999 controllers can be clustered as a single system to support over 100,000 IP ports. Mitel's MiVoice Business System Data Synchronization technology is used to enable feature transparency across a cluster of controllers.

[9]Up to 748 mailboxes can be used for users or multi-level auto attendant. Two mailboxes are reserved for Administration.

Digital Trunk Connectivity

DUAL EMBEDDED DIGITAL TRUNK MODULE (MXE III-L CONTROLLER AND AX CONTROLLER)

- Each module has two E1/T1 trunk interfaces (links)
- Provides PRI / QSIG / T1-D4 / T1 CAS (T1-D4) / DASS II / DPNSS / IDA-P protocol through the controller (No NSU required)
- Each interface can run a different protocol, either PRI, QSIG, or T1-D4

DOES NOT SUPPORT:

- EX does not support QSIG, DASS II, DPNSS

EMBEDDED BRI MODULE (CX II / MXE III-L / AX CONTROLLERS)

The Embedded BRI module has four Basic Rate Circuits (total 8 – 64kbs channels)

EACH CHANNEL MAY BE CONFIGURED AS EITHER A:

- T (trunk) interface for links from a BRI Central Office (CO)
- S (subscriber) interface for connecting up to eight BRI devices.

Note: S interfaces support only basic call features such as calling number display for BRI devices (BRI call handling such as Hold or Transfer are not supported). BRI devices are not line powered from the embedded BRI module.

Note: This module does not support U interfaces.

Dimensions

Specification	Legacy CONTROLLER	ANALOG SERVICES UNIT (ASU II)	EX Controller
Height	**CX II** – 3.5 in. (8.9 cm.) (2 U) **MXe III** – 3.5 in. (8.9 cm.) (2 U) **AX** – 13.35 in. (39.90 cm.) (7 U)	3.3 in. (8.4 cm.) (2 U)	EX – 1.75 in. (4.4 cm.) (1 U)
Width	**CX II** - - 17.75 in. (45.1 cm.) (19 in. rack mountable) **MXe III** - 17.75 in. (45.1 cm.) (19 in. rack mountable) **AX** – 17.4 in. (44.20 cm.)	17.75 in. (45.1 cm) (19 in. rack mountable)	EX – 19 in. (48.5 cm.) with mounting ears
Depth	**CX II**– 16.5 in. (41.9 cm.) **MXe III** – 20.25 in. (51.4 cm.) **AX** – 13.87 in. (35.23 cm.)	13.3 in. (33.8 cm.)	EX – 13 in (3 cm.)
Weight	**CX II** – 19.8 lb. (8.98 kg.) **MXe III** – 28 lb. (12.7 kg.) **AX** – 39.70 lb. (18.01kg.)	14.1 lb. (6.4 kg.)	EX – 15 lb. (7 kg.)

Operational Environment

Specification	Legacy CONTROLLER	ANALOG SERVICES UNIT (ASU II)	EX Controller
Temperature	CX, MXe, AX 40° to 122°F (4° to 50°C)	40° to 122°F (4° to 50°C)	EX 32° to 122°F (0° to 50°C)
Humidity	CX, MXe, AX 5% to 95% relative humidity, non- condensing	5% to 95% relative humidity, non-condensing	EX up to 85%, non-condensing
Max Heat Dissipation (Fully Loaded)	**CX II** - 170 BTUs per hour **MXe III**– 750 BTUs per hour **AX** – 1024 BTUs per hour	260 BTUs per hour	280 BTUs per hour
Air Flow	46 cubic ft. / min. at maximum output of fans AX – 110 cubic ft.		
Acoustic Emissions	Max 50dBA continuous, 75dBA intermittent (<10% duty cycle)		

Conversion factors: One watt is equal to 3.412 BTUs per hour. One ton of refrigeration is equal to 12,000 BTUs per hour or 3.516 Kilowatts, and 0.75 kilowatt-hour is equal to one ton of refrigeration.

System Input Requirements

Specification	Legacy CONTROLLER	ANALOG SERVICES UNIT (ASU II)	EX Controller
Input / Disconnect	IEC320-C14 Class 1 AC Receptacle 2 AC Receptacles on AX and MXe III with redundant power	IEC320-C14 Class 1 AC Receptacle	IEC320-C14 Class 1 AC Receptacle
Input Voltage / Frequency Rating	100 – 240 VAC 50 / 60 Hz	100 – 240 VAC 50 / 60 Hz	100 – 240 VAC 50 / 60 Hz
Input Power	**CX II** – 250 W **MXe III-L** – 200 W **MXe III-L Expanded** – 250 W **AX** – 300 W	125 W max	90 W
AC Source	90 – 264 VAC	90 – 264 VAC	
Frequency Range	47 – 63 Hz	47 – 63 Hz	

Glossary

ACD	Automatic Call Distribution
ASU	Analog Services Unit
BRI	Basic Rate Interface
BTU	British Thermal Unit
CAS	Channel Associated Signaling
CCS	Common Channel Signaling
CIM	Copper Interface Module
CLASS	Custom Local Access Signaling Services
DASSII	Digital Access Signaling System #2
DID / DDI	Direct Inward Dial / Direct Dial In
DNI	Digital Network Interface
DPNSS	Digital Private Network Signaling System
DSP	Digital Signal Processor
DTMF	Dual Tone Multi-Frequency
IP	Internet Protocol
ISDN	Integrated Services Digital Network
LS	Loop Start Trunk
MMC	Mitel Mezzanine Card
MOH	Music on Hold
NFAS	Non-Facilities Associated Signaling
PRI	Primary Rate Interface, ISDN
QSIG	Q-Signaling Protocol
RSTP	Rapid Spanning Tree Protocol
SIP	Session Initiation Protocol
STP	Spanning Tree Protocol
T38	ITU protocol to send FAX transmission across IP Networks
VM	Voice Mail
XNET	Switched Networking
TRUNKING GATEWAY	A Controller used specifically to land PSTN trunks and route them onto a User Gateway
USER GATEWAY	A Controller / Server used specifically to manage and control Telephones. External traffic is routed via a Trunking Gateway
CONTROLLER	Mitel's telephony platform that runs Mitel MiVoice Business

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6050-16480-123456-SS0715-EN

MiVoice Business Overview

Business Communications Your Way, with Comprehensive and Flexible Solutions for On Premises or in the Cloud

In today's fast-paced, competitive, technology-led business environment, business success is built upon establishing and maintaining relationships, providing exceptional levels of service, and connecting with customers and colleagues in a timely manner.

Having the ability to quickly and effectively communicate and collaborate with customers, partners, colleagues and suppliers anytime from anywhere is critical to the growth of your business.

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At Mitel, Job 1 is understanding your business needs and your infrastructure preferences, including what communications solution components to deploy and where to deploy them—on premises, in the cloud, or both - so that you can maximize your Return on Investment (ROI).

Together, Mitel MiVoice Business, Mitel MiCollab, and Mitel MiContact Center comprise a complete, cost-effective, unified communications solution that fits seamlessly into your existing IT framework to meet all of your business needs.

Key Business Solutions

- Mobility
- Unified Communication and Collaboration
- Unified Messaging
- Contact Center
- Full Range of Desktop Devices and Accessories

MiVoice Business provides the foundation to building a flexible, real-time communications landscape that can help your business with addressing the different needs of your employees. Whether it's related to job roles, varying levels of mobility within or outside of the business, or the daily use of business applications or industry frameworks, MiVoice Business can address your current needs, yet evolve with your business as your IT strategies and communications needs change.

Mobility

The reality of the current business landscape is that work often takes employees away from their desks, and their desk phone, each day.

With MiVoice Business, employees are provided with access to the same "in-office" communications experience from anywhere with a single identity, phone number and Unified Messaging mailbox.

MiVoice Business's embedded mobility solutions deliver employees greater freedom to communicate from wherever their business takes them, without the burden of escalating mobility costs.

DYNAMIC EXTENSION

MiVoice Business's embedded twinning solution provides businesses with the ultimate in cost-effective, "no compromise" mobility by letting employees select up to eight devices (regardless of device type) to act as their business phone, so all of their phone numbers collapse into one, giving them a single identity through their business extension.

HOT DESKING

Hot Desking (sometimes also known as hoteling) allows employees to log into any Mitel MiVoice IP Phone, located at any of your offices, or even at their home, so that they continue to be accessible and productive by having their calls directly routed to the device they are logged in to.

With MiVoice Business's External Hot Desking function employees can even log into external communications devices, such as their home phone, in order to take calls just like they would if they were using a Mitel IP desk phone in the office.

TELEWORKER SOLUTION

The Mitel MiVoice Border Gateway teleworker solution provides remote and mobile employees with seamless, secure access to the full set of MiVoice Business communications capabilities wherever they are, using any Mitel IP desk phone or MiCollab Client soft phone over the Internet from their home or remote office.

Unified Communications and Collaboration

A direct result of today's world of business is that organizations are faced with a number of challenges. From how to get employees to efficiently and effectively work together to help drive change throughout the business to ways to improve client interactions that drive increased revenue?

Mitel's MiCollab is an integrated suite of unified communication and collaboration solutions that work seamlessly together to allow employees to effectively and effortlessly connect with colleagues, customers, and partners - no matter where their day takes them.

MICOLLAB CLIENT

MiCollab Client provides employees with a single access point for all their business communications and collaboration needs. Employee instantly benefit from real-time access to everyone in the organization to enhances the overall effectiveness of "in the moment" communications. Furthermore, going mobile is simple with MiCollab Client for mobile devices. When installed on an employee's mobile device (Android™, and iPhone® / iPad®) key unified communications (UC) capabilities are extended to the mobile worker, such as presence and availability of colleagues, single number identity, instant messaging, visual voice mail, and more. Android and iOS devices additionally benefit from an integrated SIP softphone that allows voice over Wi-Fi or cellular networks so that they can remain connected, while on the move.

CONFERENCING, COLLABORATION AND TEAM WORKING

MiCollab team working, collaboration audio and video conferencing capabilities provides users access to the tools that are vital to having a workforce that is connected with others - both inside and outside of the business - wherever they are. This includes being able to easily create scheduled and ad-hoc conferences on the fly, sharing applications and documents during a meeting, and conducting multi-point video conferencing with others using a standard webcam.

Unified Messaging

Unified Messaging enables your employees to respond faster to clients and colleagues through single message storage and access. With MiVoice Business your employees have anywhere, anytime access to messages with an integrated, fully featured voice mail system, that provides unified messaging and automated attendant capabilities.

MIVOICE EMBEDDED MESSAGING

Mitel's MiVoice unified communication platforms offer entry-level embedded voice mail solutions that provide cost effective voice and unified messaging solution for up to 5000 users.

MICOLLAB UNIFIED MESSAGING

For more advanced unified messaging features Mitel's MiCollab solution offers Unified Messaging capabilities. MiCollab Unified Messaging is available on both physical and virtual deployments and offers a full-featured and flexible unified messaging solution with a low total cost of ownership to satisfy the diverse needs of your organization.

MiCOLLAB ADVANCED MESSAGING

Mitel's MiCollab Advanced Messaging solution is a highly scalable, robust, and sophisticated messaging solution with increased scaling up to 120,000 users, and offers unique deployment integrations with business continuity auto attendant capabilities and is available for physical premises-based or virtual deployments

Contact Center

Contact centers can help improve your customers' experience by ensuring that calls always go to the right agent – anytime, anywhere, and by any means. To meet the needs of internal "customers," some departments within your organizations may even perform a contact center role without thinking of themselves as contact centers.

MiVoice Business's fully integrated contact center solution can assist your business with the delivery of excellent customer service that helps nurture relationships and ensure operational efficiency. MiVoice Business also supports the following management, reporting, and advanced routing solutions as well.

CONTACT CENTERS

MiContact Center Business delivers robust contact center, IVR, and multimedia functionality and reporting that is suitable for small contact centers that have sophisticated requirements though to large scale enterprise contact centers with 100s of agents.

MiContact Center Business is a robust, highly flexible solution that delivers feature rich IVR capabilities and contact center monitoring, reporting, forecasting, and agent productivity tools for the most sophisticated contact centers, including virtual, omnichannel contact centers with multiple locations and remote agents.

OUTBOUND CONTACT CENTERS

MiContact Center Outbound is a preview, progressive, and predictive outbound dialing solution that includes tightly integrated Customer Relationship Management, campaigning, and agent scripting capabilities.

Full Range of IP Desktop and Accessories

Customer service personnel, office administrators, and call center agents. Many employees who perform similar roles within your business can spend their whole day on the phone. That is why having the right desktop phone that can provide them with access to convenient features and appropriate functionality is essential to making their jobs easier and helps them perform better.

Whether it's personal huddle room solutions for executives, or add-on peripherals for keeping front-line personnel in touch anywhere and anytime, MiVoice Business offers a full range of IP desktop devices, accessories, and meeting room solutions that deliver advanced applications when and where you need it.

MIVOICE 6900 SERIES IP DESKTOP

From affordable entry-level IP phones to rich media information devices, MiVoice 6900 Series have the right communications solutions for your employees. These include cost-effective two-line phones, traditional button phones, and self-labeling application phones that provide users with ample personal programmable keys.

MIVOICE PERIPHERALS & ACCESSORIES

Complementing the MiVoice 6900 Series IP phones are MiVoice Desktop Peripherals that offer additional enhancements to existing MiVoice IP phones in order to evolve an employee's phone. These include the Mitel DECT Handset that provides employees personal mobility up to 150 feet away from their desk, Cordless Handset and DECT Headset to provides employee's with hands-free and cord-free communications for up to 300 feet away from their desk, and Personal Key Modules to provide phone power users with additional personal, programmable keys.

ATTENDANT POSITION CONSOLES

Whether it's a hard-button console that looks like a phone or a completely PC-based solution that provides the ability to view and change employee presence status, MiVoice Business has a solution for your operators and receptionists to assist with delivering a positive experience to your callers.

MiVoice Business's open, fully modular Freedom Architecture is neutral when it comes to data infrastructure and communications components.

Deployment Flexibility

MiVoice Business call control software allows you to operate your communications system with flexibility, ease, and reliability on your choice of hardware platform:

- The family of Mitel purpose built appliances
- Industry standard servers from Oracle®, HP®, IBM®, and Dell®
- VMware® vSphere™ and Microsoft® Hyper V™ virtualization platform, support for businesses that want to manage business communications like any other application in their data center

With a choice of deployment models (distributed, centralized, private and public cloud) as your IT strategy shifts, so too can your communications strategy.

Open Architecture

MiVoice Business frees your business from proprietary technologies, by letting you choose the hardware and UC components that work best for your business.

MiVoice Business provides integration with most of the industry's widely deployed back office applications.

STANDARDS-BASED ARCHITECTURE

Adhering to industry standards, MiVoice Business enables your businesses to leverage your existing business infrastructure and provides a smooth transition to a network-centric communications model. MiVoice Business's core call control features and functionality are the same regardless of the hardware platform or solution deployment model and can operates across virtually any LAN / WAN infrastructure. With native support for legacy networking standards such as Q.SIG and DPNSS in addition to digital trunking ISDN protocols for central office (PSTN) access, MiVoice Business offers your businesses the ability to retain existing investments irrespective of legacy PBX, while delivering all the advantages of a converged communications infrastructure that natively supports Session Initiation Protocol (SIP).

SIP PROTOCOL SUPPORT

When it comes to open standards, MiVoice Business natively supports connection to both SIP lineside devices and SIP trunks. No extra hardware or software is required to support SIP users or trunks, greatly simplifying the solution administration when using the SIP Protocol.

Simple, Powerful, Web-Based Management

MiVoice Business delivers a broad range of administration functions and capabilities all within a simplified web-based management architecture that reduces the time and resources required to perform tasks and administer changes. System changes are automatically synchronized across the solution, and management control and tasks can be delegated across the organization.

SIMPLE END USER PROVISIONING

Administrators can quickly create and provision new employees with preformatted departmental role-based templates. Employee information is automatically synchronized across all other MiVoice Business and MiCollab solutions in the network ensuring database reliability. Integration with Microsoft® Active Directory® means administrators can configure a user once in Active Directory, and the user will automatically be configured within MiVoice Business – saving your business considerable time and simplifying large deployments.

EMERGENCY CALL NOTFIFCATION

MiVoice Business natively supports the ability to provide location information and notification when an emergency call is made and also integrates with Mitel Revolution to support mass notification capabilities and channels outside of the telephony solution.

Technical Specification

LANGUAGES SUPPORTED

English, Dutch, French, Italian, German, Portuguese (Europe), Portuguese (Brazil), Romanian, Russian, Swedish, Polish, Spanish (Europe), and Spanish (Latin America).

Supported Platforms

Mitel Standard Linux[1]	11.0
VMware™ (vCenter / vSphere)	6.7
HyperV	2016
3300 CXII, AX, EX etc.	

[1] Linux® is the registered trademark of Linus Torvalds in the U.S. and other countries.

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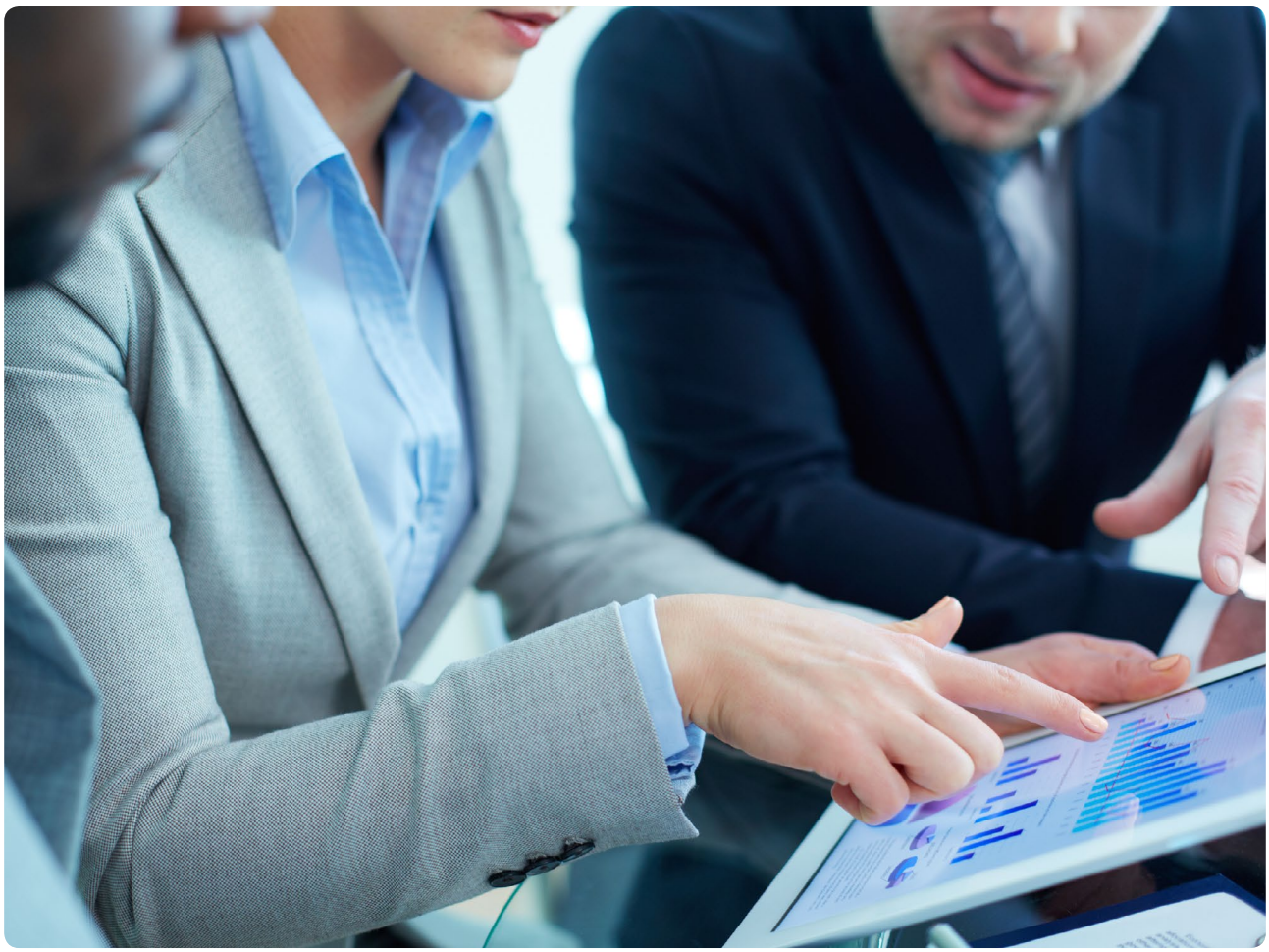
MiVoice Analytics

Track, monitor and control telecommunication usage and cost



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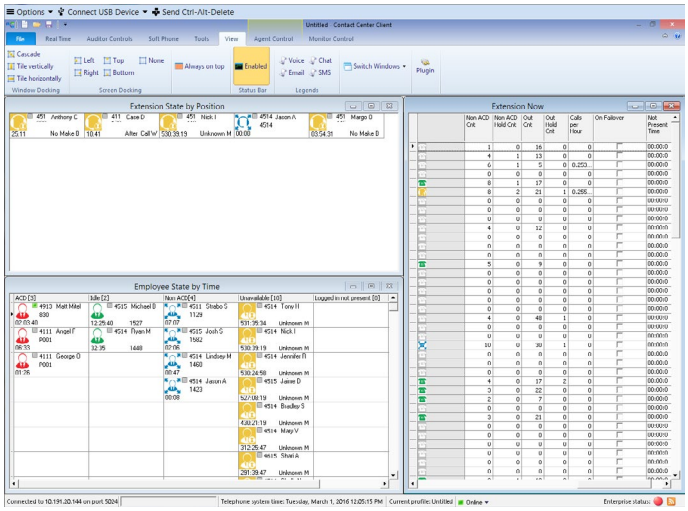
MiVoice Analytics

A telecom infrastructure is at the core of any organization, allowing you to interact with your most valuable assets – your employees and your customers. A comprehensive call management solution gives businesses the edge they need by increasing employee productivity, reducing costs, and optimizing telecom setup.

Call management requirements

- Optimize the use of both employees and system resources
- Efficiently route incoming calls to your business
- Monitor telephony use and performance and identify opportunities for improvement
- Proactively monitor telecom costs and identify opportunities for cost savings



The solution? MiVoice Analytics!

MiVoice Analytics is a comprehensive general business reporting, management, and call costing solution for the MiVoice Business platform that is available as either a single or multi-site solution, on-premises or in the cloud, and can optionally be integrated with MiContact Center Business.

MiVoice Analytics is available to MiVoice Business customers in two licensable bundles:

- *Call Accounting – for historical call costing, subscriber services, and traffic analysis reporting*
- *Business Reporter – for general business extension reporting (includes Call Accounting)*

MiVoice Analytics is also included out-of-the-box with MiContact Center Business.

Get the complete picture

When you need to know how incoming and outgoing calls are handled by the employees in your business, MiVoice Analytics reports can provide you with all of the historical analytics you need. In addition to this, MiVoice Analytic' Business Reporter option enables you to proactively monitor employee and extension telephony use in real time. Whether it's an overview of call activity or a specific call record, the MiVoice Analytics real-time and historical reporting capabilities can help you track, understand, and predict employee call patterns, so that you can efficiently and effectively manage your telecom use and make changes to optimize the system. Want to know who made a particular call? MiVoice Call Accounting and Business Reporter reports and data mining tools aid the search for specific call records. This helps you determine who called whom, where callers were transferred, the phone number dialed the caller dialed, and more.

Optimize the caller experience

You don't have to be a full-fledged contact center to handle calls promptly! With MiVoice Analytics' Business Reporter capabilities, you can route calls using ring group functionality, ensuring that no call goes unanswered, and that calls are answered promptly. Using MiVoice Analytics reports, IT specialists can familiarize themselves with call patterns and use that knowledge to identify trunk lines, system infrastructure, and personnel resources that are overwhelmed or underused. By adjusting trunk usage and personnel resources, businesses can even out the peaks and valleys of telecom activity, realize cost efficiencies, and ultimately, provide better service to customers.

Detect telecom misuse

The FBI and FCC estimate that over U.S. $4 billion in losses due to toll fraud occurs each year. MiVoice Analytics' Call Accounting reports help you detect telecom misuse so it can be stopped before it amounts to significant revenue loss. Using historical reports, you can monitor employee call activity, and by adding Business Reporter for real-time call costing capabilities, you can detect if misuse is occurring in real time and quickly take action.

Recover costs

With MiVoice Analytics Call Accounting option, you have access to a wide range of subscriber services reporting capabilities. This allows you to identify and determine the cost of calls made by each user/department, so you can accurately bill back the users/departments. With Call Accounting's subscriber services features, billing options can be including in reports and cost can be easily marked up or discounted either by a percentage or by a flat rate.

Increase profits

Gartner estimates that 10 percent of telecom invoices are incorrect, usually to the advantage of the carrier. With MiVoice Analytics' call costing tools, you can easily discover and identify billing errors. With sophisticated tools to improve visibility and control of your telecom usage, you can drive significant cost savings.

Enjoy continuous service

Even minor, unplanned outages can have a negative impact on business operations. When a controller or network failure occurs, the MiVoice Analytics resiliency option gives your business network the ability to maintain calls in progress and handle new incoming and outgoing calls.

MiVoice Analytics enables you to:

- *Route calls using ring group routing algorithms*
- *Monitor usage and establish call patterns for departments and work groups*
- *Control telecommunication costs with real-time and historical tracking and reporting*
- *Recover costs through carrier bill reconciliation*
- *Control and reduce the costs of employees sharing toll free lines, calling restricted numbers, or calling their friends long distance*
- *Charge back departments, employees, and customers using markup or discount pricing*
- *Control and reduce costs by analyzing the efficiency of your incoming, outgoing, and bi-directional trunks*

The benefits of MiVoice Analytics include:

- *Incorporate data from multiple telephone systems to get the "big picture"*
- *Manage call flow and schedule employees when they are needed*
- *Know the distribution of telecommunication costs across departments and work groups, and verify carrier bills*
- *Know the availability of your employees, who they are speaking with, and how long they have been talking*
- *Resolve misuse of the telephone system*
- *Produce flexible rate tables that are tailored to the organization*

MiVoice Analytics licensing

NOTE: MiContact Center Business' Workgroup and Contact Center Starter Packs both include MiVoice Analytics out of the box. All parts are included in starter packs except for Business Reporter Client which is optional.

	Call Accounting Call Accounting Extensions	Business Reporter Business Reporter Extensions
Call costing	•	•
Subscriber services	•	•
Historical reporting	•	•
Real-time monitoring	-	•
Ring group support	-	•
Real-time call costing	-	•
Report distribution	•	•
Traffic analysis	•	•
Attendant consoles	•	•
Trunk reports	•	•
2 System admins	•	•
Network License	•	•
Toll Fraud	•	•
Available to Business Reporter only (optional) **Business Reporter Client** • *Phone set manager* • *General business screen-pop (CCC)*		•

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001246-R1602-EN

Mitel Performance Analytics

BETTER NETWORK PERFORMANCE FOR BUSINESS SUCCESS.

Mitel Performance Analytics is a fault and performance management solution that proactively monitors and manages your entire network.

Key Benefits

- Faster problem detection and resolution.
- Simplified management of large networks.
- Improved user satisfaction and adoption.
- Better use of IT resources.

Key Features

- Intuitive, multi-tenant data rich dashboards.
- Comprehensive testing tools and secure remote access.
- Network diagram integration.
- Reporting tools that add value.

Mitel Performance Analytics

Reliable unified communications network performance improves the user experience and makes better use of an organization's IT resources. Mitel Performance Analytics is a fault and performance management software that monitors and manages your entire network, with a special focus on voice quality. The result is faster problem detection and resolution and reliable network performance.

Product at a Glance

- Continuous performance monitoring.
- Real-time alerting for fast problem detection.
- Secure remote access and testing tools means problems are fixed faster.
- Shifts support model from reactive to proactive, detecting and preventing problems BEFORE users impacted.
- Proven in more than 5,000 Mitel customer networks.
- End-to-end network performance management of Mitel AND the surrounding network.

Network Insight and Performance

Monitoring

Mitel Performance Analytics gives deep visibility into Mitel UC performance by monitoring the status and performance of Mitel and third-party systems in the network.

Proactive UC network performance monitoring assesses voice quality as well as overall system and individual application performance.

Network Diagrams

Visualize the source of a voice quality problem on a Visio network diagram uploaded by the MPA user. Quickly gain insight into which device is experiencing issues and what is causing the problem.

IPT User Dashboards

View data for each user, including voice quality for each call.
Dashboards display data by user including:

- Name, directory number
- Services and groups
- Alarms for user

Network Tools

Testing and Troubleshooting

Identify the source of a problem quickly, for faster resolution.

- Network diagnostics tools can be launched from any device.
- Remote IP set network test tool allows you to run IP traceroute directly from MiVoice Business handset.

Secure Remote Access and Single Sign-On

Easily access network devices anywhere in the world, for more efficient troubleshooting and maintenance.

- No VPN required and single click device access.
- Integrated web-proxy server for remote access.
- Single sign-on for fast access to MiVoice Business.
- Authenticated and encrypted with SSL, SSH and HTTPS.
- VMWare ESKI and 2 Factor Authentication for added security.

> Hospitality is a 24/7 business, and Mitel Performance Analytics has been keeping Firmdale ahead of UC network performance problems for more than four years, improving our guest experience. Mitel is always improving and augmenting its offering, solving more of our network performance challenges from a single pane of glass.
>
> Mark Rupert Read - FIRMDALE HOTELS

Reports and Quick Queries

Reports demonstrate network and device performance, improving capacity planning and trend identification.

Container-Level Reports

- Performance and availability of devices over reporting period
- Reports by container or by device
- PDF format, delivered via email, includes preview and archive
- Monthly, weekly or on-demand

Quick Queries

- Retrieve key data, delivered in .csv format
- Optional pie chart pivot table displays

Analytics and Advanced Reporting

Voice Quality Cause Visualization

Voice quality correlation graphs point towards the root cause of a problem, allowing you to spot trends. Detailed reports help quickly identify and assess voice quality.

Voice quality reports can be easily shared and include:

- A high level VQ score of a specific device or container.
- Isolated factors that could affect or impact the VQ score.

Voice Quality Cause Visualization Trunk Traffic and MiCollab AWV Utilization Reports

- Know when more capacity is needed for better performance.
- PDF reports are easily downloaded and shared.
- See usage reports for audio, web and video.

Advanced Inventory Reporting

- Create custom reports with key inventory data.
- Report templates can be saved and downloaded.

Management Functionality

Simplify common management and administration operations with Mitel Performance Analytics.

Device Operations Scheduler

Schedule key operations for single or multiple devices.

Schedulable Maintenance Mode

- Configure and schedule maintenance mode for greater flexibility when devices are out of service, avoiding alerts.

Backups and SMDR Collection

- Scheduled or on-demand backups, for single or multiple MiVoice Business or MiVoice MX-ONE systems.
- Scheduled or on-demand SMDR collection, for MiVoice Business, MiVoice MX-ONE or MiVoice Office 250.

Flexible Alerting

Real-time alerts provide timely, actionable data on network issues, so problems are resolved more quickly.

- Custom alarm filters help manage service level commitments while schedulable alarm filters automate the process.
- Flexible alarm management allows you to decide how and when you receive alerts to reduce alarm fatigue.
- MPA has three types of alarms, device, threshold, and system to give you control of the type of alarms that are seen and actioned.
- MPA listens for incoming Emergency Response SNMP traps.

Device Discovery

Whether you are licensing one device or one thousand, MPA makes it simple - making it ideal for managing large, multi-node Mitel networks.

Device Discovery: MPA scans the network and discovers devices, speeding the set-up process.

System Configuration Wizard: Simplifies system set up and onboarding/licensing of new devices.

FEATURE	MPA	MPA PLUS
DEPLOYMENT OPTION	CLOUD / ON PREMISE	CLOUD / ON PREMISE / AIR GAPPED
Device Support	✓	✓
Trunk/Route/Gateway/Utilization	✓	✓
Remote Access/Single Sign-On	✓	✓
Testing Tools	✓	✓
Alarms & Alerts	✓	✓
Reports & Queries	✓	✓
Backups & SMDR Collection	X	✓
Group Operations Scheduler	X	✓
IPT User Dashboard	X	✓
Inventory Reports	X	✓
Set & Extension Inventory	X	✓
Advanced UX Network Testing	X	✓

PD-3504G

4-port 802.3af Compliant Gigabit Midspan

Summary

Microchip's PD-3504G offers a cost effective, IEEE 802.3af compliant solution to upgrade existing infrastructures with PoE, providing a maximum of 15.4 watts of power through each port and ensuring safe operation of any standard PoE data terminal. The PD-3504G provides PoE to IP telephones, wireless LAN access points, security network cameras and IP terminals to receive power, along with data, over standard Ethernet cables, leaving network infrastructure completely unaltered.

With the midspan's plug-and-play installation, they are easily and cost effectively implemented leveraging an existing Ethernet infrastructure while at the same time providing the assurance of a future proof network.

PD-3504G Features

- Safe and reliable power over existing Ethernet infrastructure
- IEEE 802.3af compliant
- Stackable and compact
- Legacy PoE support
- Plug-and-play installation

Feature	Description
Number of Ports	4
Data Rate	10/100/1000 Mbps
Input Power Requirement	AC Input Voltage: 100 to 240 Vac AC Input Current: 1.6A AC Frequency: 50/60 Hz
Output Power	15.4W
Power over Ethernet Output	4/5 (+), 7/8 (–) Nominal Output Voltage: 55 VDC
Dimensions	L x W x H 224 mm x 148 mm x 43 mm 8.82 in x 5.82 in x 1.69 in
Net Weight	820 gr (1.8 lbs)
Connectors	Shielded RJ-45, EIA 568A and 568B
Indicators	System Indicator: AC Power - Green User Indicator: Channel Power - Green
Environmental Conditions	Operating Ambient Temperature: 32ºF to 104ºF (0ºC to +40ºC) Operating Humidity: Maximum 90% Storage Temperature: –4ºF to +158ºF (–20ºC to +70ºC), Non Condensing Storage Humidity: Maximum 95%, Non-condensing Operating Altitude: –1000 to 10,000 ft. (–304.8 to 3048 m)
Hazardous Substances	CE, WEEE
Warranty	1 year
Extended Warranty Available	Contact Microchip
Reliability	MTBF: 300,000 hrs @25C
Thermal Rating	51 BTU/hr
Regulatory Compliance	IEEE 802.3af
Electromagnetic Emission and Immunity	FCC Part 15 Class B EN 55032 Class B EN 55024 VCCI
Safety	UL/IEC/EN 62368-1 Please contact Microchip for a complete list of certifications

Technical Support

For technical support please visit the Microchip Technical Support Portal www.microchip.com/support.

Ordering Information

Part Number	Name	Ports
PD-3504G/AC-XX PD-3504G/AC-AU Australia Power Cord PD-3504G/AC-EU European Union Power Cord PD-3504G/AC-JP Japan Power Cord PD-3504G/AC-UK United Kingdom Power Cord PD-3504G/AC-US United States Power Cord	PD-3504G	4-port

Contact Microchip for other options

About Microchip mPoE

Microchip multi-Power over Ethernet (mPoE) is a technology that powers any wired network device seamlessly and efficiently, making it the ideal solution for Ethernet-based applications. Leveraging a uniquely designed algorithm, this technology solves interoperability issues between different PoE standards and legacy solutions to provide an international network power standard. As a pioneer in PoE technology, we offer a comprehensive end-to-end portfolio of PoE solutions comprised of PoE ICs and PoE systems (midspans/injectors and switches).

DS00003959B

PD-6500G Family

Multi-port 802.3af Compliant Midspan Family With Network Management System

Summary

Microchip's PD-6500G family sets a new standard for highly secure, intelligent, remotely-managed and safe-to-use PoE. Microchip's 6500G family includes 12 and 24-port models, making an even wider range of flexible Power over Ethernet installations possible. The PD-6500G family provides up to 15.4W of power over Ethernet to IP telephones, wireless LAN access points, security network cameras and many other types of data terminals over standard Ethernet data cables, leaving network infrastructure completely unaltered.

With the midspan's Plug-and-Play installation, they are easily and cost effectively implemented leveraging an existing Ethernet infrastructure while at the same time providing the assurance of a future proof network.

PD-6500G Features

- Safe and reliable power over existing Ethernet infrastructure
- Powerview Pro remote, web-based SNMPv3 power management environment
- Legacy PoE support
- IEEE802.3af compliant
- Plug-and-play installation

Specifications

Feature	Description
Number of Ports	12/24
Data Rate	10/100/1000 Mbps
Input Power Requirement	AC Input Voltage: 100 to 240 Vac AC Input Current: 12 port unit - 4A @ 100Vac; 2A @ 240 Vac 24 port unit - 5.5A @ 100Vac; 2.75A @ 240 Vac AC Frequency: 50/60 Hz
Output Power	User Port Power: 15.4 Watts
Power over Ethernet Output	4/5 (+), 7/8 (–) Nominal Output Voltage: 52 VDC
Dimensions	L x W x H 438 mm x 272 mm x 44 mm 17.3 in. x 10.8 in. x 1.75 in
Net Weight	12-port unit - 4.7 kg (10.4 lb) 24-port unit - 5 kg (11 lb)
Connectors	Shielded RJ-45, EIA 568A and 568B
Indicators	System Indicator: AC Power - Green User Indicator: Channel Power - Green
Management	PowerView Pro included
Environmental Conditions	Operating Ambient Temperature: 32ºF to 104ºF (0ºC to +40ºC) Operating Humidity: Maximum 90%, Non-Condensing Storage Temperature: –4ºF to +158ºF (–20ºC to +70ºC) Storage Humidity: Maximum 95%, Non-condensing Operating Altitude -1000 to 10,000ft (-304.8 to 3048m)
Hazardous Substances	CE, WEEE
Warranty	3 years
Extended Warranty Available	Contact Microchip
Reliability	MTBF: 100,000 hrs @ 25ºC
Thermal Rating	170 BTU/Hr (12 Port) 320 BTU/Hr (24 Port)
Regulatory Compliance	IEEE 802.3af
Electromagnetic Emission and Immunity	FCC Part 15, Class B EN 55032 Class B EN 55024 VCCI
Safety	UL/IEC/EN 62368-1 Please contact Microchip for a complete list of certifications

Technical Support

For technical support please visit the Microchip Technical Support Portal www.microchip.com/support.

Management Software

PowerView Pro software is available on Microchip's Software Library.

Ordering Information

Part Number	Name	Ports
PD-6512G/AC/M PD-6512G/AC/M-AU Australia Power Cord PD-6512G/AC/M-EU European Union Power Cord PD-6512G/AC/M-JP Japan Power Cord PD-6512G/AC/M-UK United Kingdom Power Cord PD-6512G/AC/M-US United States Power Cord	PD-6512G	12-port, 400W total power
PD-6524G/AC/M/F PD-6524G/AC/M/F-AU Australia Power Cord PD-6524G/AC/M/F-EU European Union Power Cord PD-6524G/AC/M/F-JP Japan Power Cord PD-6524G/AC/M/F-UK United Kingdom Power Cord PD-6524G/AC/M/F-US United States Power Cord	PD-6524G	24-port, 400W total power

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