Making the transition from Centrex to IP Voice Services.

A guide for federal agencies purchasing under the WITS 3 agreement.

verizon

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1. Executive Summary: Moving from Centrex to Internet Protocol Voice Services (IPVS)

You've heard the talk–your agency needs to move into the Internet Protocol (IP) world as soon as it can. It will, they say, reduce costs, improve efficiency, make it easier for constituents to do business and simplify teleworking. Talk is fine, but now it's time to take action.

You are most likely on a team tasked to move your federal agency's remaining Centrex locations and phones within those locations to the newer technologies mandated by the General Services Administration (GSA). The task needs quick action to meet various US Government mandates, but isn't simple due to the wide variety of options.

This paper targets agencies purchasing under the Washington Interagency Telecommunications System (WITS 3) contract currently. Yet you'll find useful information for other scenarios. The paper attempts to answer three basic questions:

1. Why does your agency need to make a telecom upgrade decision now?
2. What are the options for the agency?
3. How do you decide which option best fits your agency's need?

In the "Why Now?" section, this paper gives you a short background on the various federal telecom acquisition contracts and regulations that apply. It also talks about the technology and business opportunity reasons to migrate now.

In the "Options" section, this paper gives a high-level description of Centrex, describing why it is soon to be end-of-life in carrier-product portfolios and what the replacement options are that you should be considering for your agency. The differences in technology solutions available are explored.

In the "How to Decide?" section, this paper puts together a framework of the different needs that might lead you to choose one solution over another. The appendix includes worksheets for you to use in collecting the features used by the workers in your agency.

2. Why Now?

Our phones work fine. Why is swapping out my voice network solution a requirement now?

It turns out there are many reasons, but the most compelling is the Federal buying process. The GSA is working to consolidate major telecommunication contracts for financial savings and technology advances. The GSA set deadlines for this transition. When the services are under the single, new contract, the federal government is projected to save millions of dollars. Agencies will move away from older technologies and towards technologies that support more efficient workflows for information-based jobs.

The federal government published directives and passed laws outlined later in this paper that mandate changes in telecommunications technology for the agency to achieve and maintain compliancy with current policy.

Technology has allowed voice and data to be converged on the same network for many years now, providing significant cost efficiencies for agencies in their private networks. Many local exchange carriers have started the process of migrating their Time Division Multiplex (TDM) network to an IP network. The TDM network includes the Centrex infrastructure.

Agency services need high levels of availability. Seemingly more frequent natural disasters or violent acts that disrupt operations have created the need for business-continuity planning. Your agency's mission must be accomplished even if your staff cannot reach their office.

Supporting today's information workers also requires mobility support. Workers need their supporting technology to work from remote offices or even their homes. Older phone systems, like Centrex, cannot easily support this environment or requirements. But many newer Voice over Internet Protocol (VoIP)-based technologies excel in these capabilities.

Customer expectations have changed. Today, constituents use mobile devices and expect immediate access to the information they need. They expect to communicate via voice, text, email and chat over web applications with very quick responses. Your plans to change out the agency's communications platforms should heavily consider the customer service process for the agency in accomplishing your mission.

And last, but not least, you might say, "We have to move all of our agency's services to the Enterprise Infrastructure

Services (EIS) contract by 2020. We should wait and do the technology transition then." Waiting is an option, if you have a clear plan and resources to do that.

However, a technology move can be made now under WITS 3 that is compliant with the EIS technical requirements as long as that vendor has been selected under EIS. The contract can then be transitioned from WITS 3 to EIS administratively with potentially few technology changes required. This timing will help your agency avoid the busy rush to transition to EIS that is expected in late 2018 and 2019. Making the move now will also help reduce long-term costs and improve agency agility – in a time of likely budget cuts.

2.1 GSA contracts

The GSA negotiates broad contracts for the purchase of communication products through approved vendors for the federal government. These contracts are designed to bring state-of-the-art network solutions to federal agencies at the lowest possible prices.

EIS was awarded in August 2017 and is worth approximately $50B over 15 years. It is designed to help federal agencies drive digital transformation through a comprehensive solution-based vehicle that addresses all aspects of federal agency IT telecommunications and infrastructure requirements.

As of this writing, we are in a GSA-mandated transition period for agencies with communications services purchased under the previous contracts. The transition period is an aggressive target to complete the movement by all agencies to EIS over a three-year time frame ending in early 2020. This may sound like a big ask, but the EIS contract includes a number of mechanisms to help agencies make the transition, including simplified pricing, a price-management mechanism and improved operations support. EIS makes it easier for agencies to plan for the future of their infrastructure by consolidating 90 distinct contracts into one.

Voice services are a cornerstone of any communication plan and the same is true of EIS. Under the agreement, the GSA has encouraged that agencies replace TDM services with IPVS or Unified Communications Services (UCS). Fortunately, the GSA recognized that some agencies will want to continue with their legacy systems and awarded Circuit-Switched Voice Services (CSVS) under EIS. That lets you keep Centrex services where it makes sense, but your agency will miss out on the cost benefits.

This paper was written with those agencies in mind purchasing voice services under the WITS 3 contract. WITS 3 contract will expire in May 2020. Telecommunication orders can still be placed against the WITS 3 contract, but any orders should be placed with the requirements of the EIS contract in mind.

The Networx contract is the largest previous contract slated to transition to EIS and includes negotiated terms with a selected list of vendors for voice services, managed services and networking services among other items. This whitepaper doesn't directly address the Networx contract, but many of the issues are similar in the transition to EIS.

2.2 Relevant mandates and directives requiring action

There are several federal initiatives, recommendations and directives put in place by Congress, the office of the President and key government agencies, such as the National Institute of Standards and Technology (NIST), you need to consider in your Centrex-replacement decision.

Even though individual agencies have the power to select their own telecommunication service providers and products to support their agency mission, these policies ensure technology decisions are being made within a broader federal government strategy. This strategy includes elements of security, cost reduction and support of the latest technologies to best support constituents as well as agency workers.

2.2.1 The Cloud First initiative

In December 2010 the Office of Management and Budget published a plan, 25 Point Implementation Plan to reform Federal Information Technology Management, to update Federal IT initiatives and included a statement that requires all federal agencies to use cloud-based solutions whenever a secure, reliable, cost-effective option exists. It set the cloud-first strategy.

Seven years is a long time in technology, but after moving some of the "low hanging fruit" applications to the cloud, agencies have struggled at times with other barriers of security, pricing, and logistics. Presentations and published comments from Federal-focused IT conferences report that 2017 was finally the time when agencies report that the move to the cloud is an achievable focus.

This applies to telecommunication products as well as data and computer products. Just like Centrex moved the Private Branch Exchange (PBX) from the customer premise into the carrier environment, newer telecommunications products like IP Centrex or Unified Communications as a Service (UCaaS) also move the PBX into a cloud environment and provide a variety of advantages.

2.2.2 Support for Voice over IP (VoIP)

Recent telecommunication acquisition contracts strongly encouraged agencies to move their phone systems to VoIP. It is not an absolute mandate yet. Several factors confirm that it is not a question of if your agency will need to move to VoIP, but rather when it has no choice other than VoIP.

2.2.3 Support for Telework

The Telework Enhancement Act of 2010 requires that agencies support their workers' ability to perform their jobs remotely when approved by management. It also requires that agencies support Business Continuity plans so that the agency continues to operate in case of disruptive natural disasters or terrorist acts.

At the simplest level this requirement means that a worker needs to be able to move their phone connection as a major hub to their communications with customers and co-workers. This could mean physically moving a phone device from one connection to another or more practically with new technology, using a softphone on their computer or mobile device. Today's IPVS providers support these types of mobility. Some also allow for calls to be easily forwarded to a mobile phone as an alternative solution.

This solution could be accomplished by an on-premise IP PBX, a cloud-based IP PBX or a combination of the two. A cloud-based PBX better supports the business continuity objective when the physical building has been compromised; the business can continue quickly from an alternative facility.

2.2.4 Support for Business Continuity

The Telework Enhancement Act of 2010 also requires that agencies develop and support Business Continuity plans so that operations continue in case of disruptive natural disasters or terrorist acts.

This support is possible but more difficult with TDM Centrex products that are most often physically configured for static connections. The phone sets are expected to be at the end of a copper wire pair at the agency office where it was installed. It does usually have the benefit of using power through the copper phone wires, so will work during a local power outage, but does not have the movement flexibility of newer VoIP-based systems.

Continuity of Operations Plans (COOPS) can be simplified with automatic call rerouting in the cloud. If a facility is compromised, calls can be automatically rerouted to a secondary destination or to a worker's mobile phone or home office.

2.2.5 E911 Support

Enhanced 911 in the United States allows for the Public Safety Access Point (PSAP) answering an emergency phone call to automatically know the address based on caller ID. If the caller is incapacitated or unable to speak the location, the police department can find you.

Mobility from VoIP throws a potential wrinkle in the way this works. When the E911 system was developed, it assumed that non-wireless phone numbers were at a fixed location. For teleworking and support of working in multiple offices, VoIP systems allow users to take their phone number home through either physically moving the phone or using a softphone app on your PC or even wireless phone.

For safety, an employee can update their E911 address on-the-fly using their unified communications client so the PSAP gets the correct dispatch location for an emergency call.

2.2.6 Support for People with Disabilities

The Electronic and Information Technology Accessibility Standards under Section 508 of the Rehabilitation Act has been refreshed and requires that telecommunications systems support devices for visually and hearing impaired individuals. A wide variety of new technology is available that translates between speech and text.

Section 508 Voluntary Product Assessment Templates are available upon request to assist in compliance research and due diligence.

2.3 Why move now for technology reasons?

2.3.1 Short history of business phone systems

Business use of a phone requires more than just making and receiving calls. Features such as transferring calls, conferencing multiple lines, creating internal dial plans, ringing multiple phones at the same time or dozens of other phone features all require a switch device dedicated to that enterprise phone network. This device is called a PBX and was historically stand-alone hardware located on a business premise. Many enterprises and agencies still use an on-premise PBX for their phones services today.

In the 1960s, telephone companies invented a way to migrate the functionality of customer PBXs into the large central office switches of the phone company. Centrex was born. In many situations it was easier and more cost effective to deploy a Centrex service instead of installing and maintaining an on-premise PBX.

2.3.2 Centrex

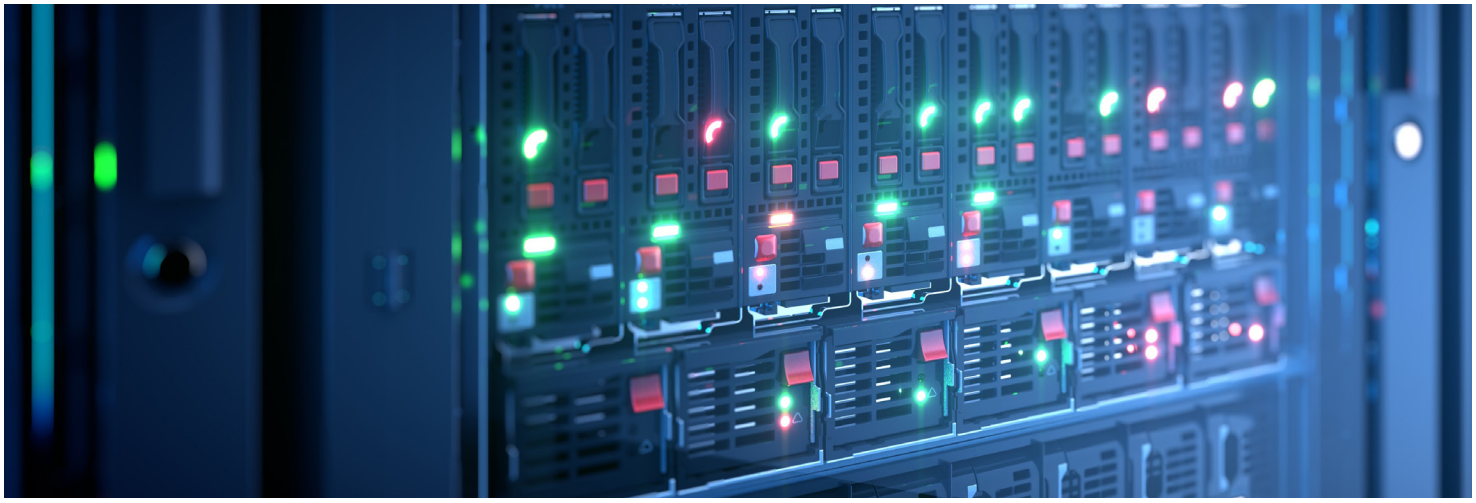
For nearly 60 years, Centrex has been one of the go-to technologies for voice communications in commercial and public organizations – and for good reason. Hosting their PBX at a central office allowed organizations to establish a private, full-function voice platform without the high capital outlay or ongoing support requirements of an on-premises system. And it wasn't just small-and medium-size companies that were drawn in by these benefits, large enterprises, universities and federal and state agencies also opted for Centrex – especially as carriers added more features to the service.

But the Centrex era is coming to a close as new technology replaces the carrier core switches in their central offices that Centrex is based on. The new technologies include all the features of Centrex that Agencies rely on, but also support mobility and integration with data communications most of us now use on a daily basis in our work and personal lives.

2.3.3 Enter VoIP

In the 1990s we experienced a huge growth in computing and IP networking (the Internet) and companies developed VoIP products for cost efficiencies and additional features and functionality. The rise in computing power spurred on companies to develop large software-based switches, called soft switches, to control these VoIP calls and replace the very large electro-mechanical switches in phone company central offices spread throughout the country. Within the past decade, many central office switches were replaced with soft switches to manage operational costs and to accommodate the move from dedicated switched networks to IP networks. A similar software product emerged to replace the on premise PBX that was called an IP-PBX or call server.

These issues have prompted the GSA to mandate that federal agencies migrate away from Centrex to VoIP as part of its EIS contract. The good news is that shifting to IPVS can bring a number of additional benefits to federal agencies, while still offering low capital requirements and simplicity of Centrex.



3. What are the options for my agency?

Many product options are available that provide wide ranging capabilities and benefits. The products can be grouped into four categories for easier comparison. Appendix 2 contains a worksheet matrix of these four product groupings with the benefits and limitations of each. The worksheet has a column for you to capture the most important needs of your agency.

3.1 What about staying with Centrex?

As mentioned above, Centrex is nearing end-of-life, but it is still available and will be supported for the foreseeable future by some carriers. No new features will be added, so it is a dead-end street product wise. If it still fits all the needs of your agency for the next five years, then it may be a viable option. Consider an older man who still watches movies on his VHS tape player instead of DVDs or steaming. Why? He only watches a couple movies a year, claims his eyesight doesn't see a difference in the newer high definition technologies, he owns the needed equipment, and it works! His luck might be stretched finding the latest blockbuster release on VHS, though.

3.2 An IP PBX on premise?

An on-premise IP PBX leaves the main call control server usually in the agency headquarters location or main datacenter.

It can be a good option for agencies that require complex, custom integrations of their phone system with other applications. The main drawback from this option is the need for highly skilled people to configure and maintain the IP PBX.

3.3 A cloud-based IPVS product?

At a minimum, IPVS should replicate all of the features of your current Centrex system. But some IPVS providers can extend to a number of services that can improve how your agency communicates, including mobility, audio and video conferencing, desktop and file sharing. All these services help your teams and your stakeholders to communicate with each other how they want and when they want. If someone is unexpectedly out of the office for the day, their calls can be rerouted on-the-fly. If callers need to share a file with one another, they can do it seamlessly within the platform. VoIP fits more naturally with the way that we communicate today.

3.4 A full Unified Communications Service (UCS) Product

The EIS contract defines UCS as a service that integrates multiple communication tools such as VoIP, email, voice mail, chat, presence and video into one service on one platform. It allows for better collaboration workflows and deeper interactions with workers and customers than typical with voice only. UCS providers generally provide a higher degree of customization options than IPVS. For example, linking phone services to a proprietary application is an example of that integration.

4. What considerations should I explore when deciding?

4.1 Survey the agency's needs today

Start by thoroughly understanding how the Centrex phone system is being used by your Agency today. Learn what features are used by each end user, not just configured for the user station if possible, but actually used as part of their normal workflow. A worksheet is included in Appendix 2 that lists the most common feature sets in a Centrex deployment. A worksheet can be filled out for every user and the results consolidated to show the minimum requirements in a new phone system.

4.2 Predict the agency needs for the next five years

It's time to find your agency's strategic plans; talk to senior management and pull out your crystal ball. Meeting today's minimum requirements is a good starting point, but not your target. Think about how your agency can best use technology to achieve your mission. Both an understanding of how your agency uses the phone system today, what features are a must in a replacement, and what future features and enhancements could help the groups within your organization to improve their workflow and customer interaction to better the mission.

You should ask questions like:

How will the strategic requirements be supported and what individual features do most of the agency employees require?

Does the agency need the most basic of phone systems that provides dial tone and voice mail or does your agency require custom applications with integrated dialling and messaging?

Does your agency support teleworking today? If not, how will it be done?

Not every worker requires the same features. The agency should be able to mix and match features at the desktop level without packaging restrictions or pricing penalties.

Appendix 2 to this document includes a worksheet of the typical Centrex features available on the market. It can be used to perform a survey of the features used by every agency Centrex user or at a minimum, the features used by each job type in the agency.

4.3 Is cloud-based hosted voice secure for my agency?

Cybersecurity is a big concern today and for good reason. Hardly a week goes by where we don't hear of a new significant data breach. We don't often hear of security breaches initiated affecting voice services, but it happens. Data and voice commonly share the same data circuit, so voice services could potentially become more of a target.

We get that staying on TDM voice circuits gives your agency solid security. The physical security of your building or the carrier's central office needs to be breeched to reach the copper lines required to tap into a phone call. Or at least someone has to climb a pole.

When a PBX is no longer on the customer premise and is replaced by a cloud-based software package, it seems harder to trust the security of your applications. This has been a consideration of the GSA as well as most telecom providers.

FedRAMP is a federal program that standardizes how related security procedures apply to cloud computing. It includes a security assessment of products, authorization and continuous monitoring of the deployment as part of compliance. All cloud-based services under EIS must be FedRAMP authorized. This isn't the case under WITS 3, but very desirable.

FIPS 140-2 is a standard for encryption of communications. In the VoIP world, it means encryption of the actual packetized voice stream in each direction as well as the signalling stream used for call set up and control. This is also an EIS requirement and highly recommended for all new deployments.

The platform is one element in the security equation. You should also consider the network your calls will transverse. A Private IP network inherently offers a higher level of security over a public internet connection.

4.4 Choosing the right partner

A decision that is as important as choosing the right technology is choosing the right partner to help you design, deploy, manage and support your communications solution.

4.4.1 Reliability and future planning

Experience matters, particularly when it comes to the speciality of federal contracting requirements. Look for a partner that has delivered solutions for agencies your size. Make sure your partner has a breadth of technologies and complementary products. Look for a partner that invests in and builds future technologies, particularly one that shows investment into the future of the products you anticipate using.

Financial stability is paramount. Look at financial statements and seek the opinions of industry analysts on your potential partner.

4.4.2 Design, implementation, and training

While technology investments are important, people make a service company. Explore the team structure and interview as many members of the team that will serve your agency as possible. Design, implementation and training all take different skill sets and expertise. Look for a partner that is large enough to have dedicated departments for each of these functions and people that have broad experience in serving customers like your agency.

Look at samples of the materials that will be delivered to your agency as part of the SOW.

4.4.3 Facilities-based versus over-the-top (OTT)

A clear distinction exists between service providers that are facilities-based and those that are OTT.

A facilities-based provider owns and operates its network to connect your locations. Some providers own and operate the network facilities that might reach to the locations of all or most of the customer's remote sites. A facilities-based carrier gives the customer a single point of contact when there is an issue. This helps eliminate finger pointing to another organization or waiting around for another provider to get back to you.

An OTT provider that doesn't own the customer-site network connection usually owns and operates mostly software. Network facilities can be provided by the customer or are resold as part of a network package from these providers. When there is an issue, resolving it can be more difficult with multiple parties testing to their demarcations. Service Level Agreements (SLAs) are more difficult for OTT providers because of their lack of ownership and lack of network control.

Mixing voice packets and data packets on the same network connection is one the first applications that truly made use of quality of service (QoS) mechanisms in the IP network. QoS gives real-time traffic like voice a priority over usually less sensitive traffic like e-mail and web browsing. Full facilities-based carriers can provision QoS across your network. Non-facilities-based or OTT carriers are reliant on the network provider for QoS or SLAs around the quality of your voice service.

5. How can Verizon help?

Verizon has served federal agencies for decades. Over this time we've managed some of the largest and most challenging federal agency transitions. We understand that you have limited time and resources, and that transitioning between contracts can be a significant challenge.

Verizon has a large portfolio of products that encompasses all of the technology options discussed above. Regardless of your agency's telecommunication needs, we have a solution for you.

We developed an approach to transition that will help you maintain:

- Continuity of service with little or no disruption to your critical networks and infrastructure.
- Risk mitigation through comprehensive transition planning and communication.
- Effective program management through development of detailed program plans; and ongoing communications and detailed reporting.

A dedicated support team will manage the process from start to finish, and clearly defined on-site installation help will provide a successful migration, including:

- Automated analysis and provisioning of your Centrex migration for WITS customers. Programmatically understand what Centrex features are provisioned per user and translate those features to new configuration files.
- Dedicated engineering resources to create design documents, configure apps and users, perform system acceptance testing and provide day 1 support.
- Develop a clear migration path. Project management and delivery coordination with an SOW, implementation schedule, order tracking, project coordination meetings.
- Clearly defined on-site installation help. Site surveys, ordering, staging, CPE installation.
- End user and administrator training. Train the trainers.
- Create ongoing support and escalation procedures. Final close out meeting and project documentation.

5.1 Virtual Communications Express for Government

Verizon's Virtual Communications Express for Government is an advanced off-the-shelf unified communications solution. It is a leading choice for an agency's secure transition to cloud communications, satisfying the Federal Cloud First initiative. Transform older and management PBXs to a centrally managed cloud platform with tiered capabilities from simple phone calling and voice mail through a full unified communications deployment.

Virtual Communications Express for Government from Verizon delivers a secure, reliable cloud-based phone system without the high capital expense or burden of installing and maintaining a traditional on-premises system. Our all-in-one solution, along with its mobile app, provides your workforce, partner agencies and citizen's seamless access from virtually anywhere.

Virtual Communications Express for Government offers:

- Carrier-Class availability and reliability. Mitigate the risk of downtime from hardware, software or network failures with redundant systems in different locations. Scale to support thousands of users across multiple locations with the reliability you need for mission readiness.
- Cost control and Flexibility. Verizon's cloud subscription model allows the benefit of using Operational Expense (OPEX), helping agencies better budget and plan for the future.
- Support for the Telework Enhancement Act of 2010. Work remotely, move phones from one location to another or add lines as your agency's needs scale. Plus, with business continuity features, easily reroute calls in the event of a location crisis or outages. A seamless experience for your staff and customers.

5.2 Choose Verizon

Meeting the requirements for a Federal contract is a significant undertaking, so choosing the right partner is essential to help limit the impact on your operations and achieve value for agency.

Verizon is one of the largest global providers of communications. Federal agencies turn to Verizon for our complete portfolio of services, low-risk transition options, enhanced ease of use, cost competitiveness, and experienced team. With decades of experience serving the federal government, our track record and know-how enable us to transition agencies to the latest technologies quickly and with low risk. We understand what agencies need and we deliver the next generation mission-enabling services to address those needs.

Contact us to find out more

Appendix 1-Decision Support Matrix

Criteria Needs	Legacy Centrex	Premise based IP PBX	IPVS Verizon Virtual Communications Express	UCS Verizon UCCaaS	Your Agency Needs
Meets GSA VoIP migration mandates	No	Maybe	Yes	Yes	
Meets GSA cloud-first mandates	No	No	Yes	Yes	
FedRAMP Authorized	N/A	N/A	Yes[1]	Yes[2]	
Available under WITS3	Yes	N/A	Yes	No	
Available under Networx	No	N/A	No	Yes	
Available under EIS	Yes	N/A	Yes	Yes	
Min # Stations required	1	N/A	1	300	
Max # Stations supported	1,000s	100s	Unlimited	Unlimited	
Basic Centrex phone replacement	Yes	Yes	Yes	No	
Automated migration from Verizon Centrex	No	No	Yes	No	
Supports teleworking and mobility	No	Partial	Yes	Yes	
Supports full collaboration, chat, conferencing and desktop sharing	No	Partial	Yes	Yes	
Custom integrations	No	No	Partial	Yes	
Self-Install option	No	No	Yes	No	
Self MACD	No	No	Yes	Yes	

[1] Verizon Virtual Communications Express for Government is built on Broadsoft's Broadworks-G Platform which is in the process of becoming FedRAMP Authorized.
[2] Verizon UCCaaS for Government is built on Cisco's FedRAMP Authorized HCS-G Hosted Collaboration Solution for Government.

Appendix 2-Centrex Features for Migration Planning

Standard Centrex Features	Needed in the replacement service?
Consultation Hold	
Call Transfer	
Three-Way Calling	
Intercom	
Automatic Callback	
Call Forwarding Options	
Call Forwarding Busy	
Call Forwarding Don't Answer	
Call Forwarding Variable	
Call Hold	
Call Pick-Up	
Call Restrictions	
Call Waiting-Originating	
Call Waiting-Terminating	
Tone Block-Cancel Call Waiting	
Directed Call Pick-Up	

Appendix 2-Centrex Features for Migration Planning

Standard Centrex Features (cont.)	Needed in the replacement service?
Directed Call Pick-Up with Barge-In	
Hunting	
Call Block	
Call Park	
Caller ID with Anonymous Call Rejection	
Caller ID with Name	
Directed Call Park	
Call Block	
Executive Busy Override	
Last Number Redial	
Priority Call	
Busy Redial	
Return Call	
Executive Busy Override	
Select Call Forwarding	
Centrex Ultra Forward	
Voice Messaging	