

Unity Voice Messaging at Cisco

CISCO ON CISCO UNITY VOICE MESSAGING SEMINAR

Hello, and welcome to the “Cisco on Cisco” Program Unity Architecture and Design Solution seminar. I'm Tim Fujita-Yuhas and I'm a Program Manager with the Unified Communications Business Unit. And I've been working with IT to support the Cisco IT deployment of Unity in production. The theme of our show today is the Unity voice messaging migration at Cisco, how we designed a Unity solution. And how we migrated from our Legacy, Avaya, Octel voicemail system to a fully Cisco-powered IP voice messaging solution based on Unity and using Unity Bridge.

CHALLENGE: INTEGRATING VOICE AND DATA TECHNOLOGIES ACROSS THE GLOBAL NETWORK

We'll look at some of the challenges Cisco IT had to face during this migration. And how we overcame them, as well as some of the benefits of moving from our Legacy voice messaging system to Unity. The Cisco Unity solution, which really the combination of several IT programs. IT was implementing the next generation network, which laid the foundation for being able to move from a decentralized to a more centralized Cisco CallManager solution. The centralization of the IP telephony voice services then allowed us to deploy Unity primarily as a data center-based solution. All of these programs were global, which required extensive cross theater communications and teamwork.

SOLUTION: GLOBAL VOICE MESSAGING NUMBERING PLAN

Since our prior voicemail solution was outsourced to Avaya. This program gave us the opportunity to align the voice message numbering plan with our global IP telephony dial plan to the maximum extent possible. The voice messaging numbering plan should not be confused with the global dial plan. The voice messaging number plan is the address you enter after you've logged into Unity. Using your ID when you want to send a network voice message to another subscriber. The global dial plan is the phone number you dial when you're placing a phone call to another person. For the Unity solution, given the high concentration of Cisco employees in San Jose. Those campus users can use their five digit or their seven digit extensions as their IDs when logging into Unity. Outside of San Jose, users must use their seven digit extension to log into Unity, which are globally unique. If you are using the Unity servers auto attendant to be transferred to another Cisco employee. After you spell the user's name, Unity matches this to the employee's primary extension in Unity, which is eight digits. We use the eight plus seven digit form of their address as their primary extension to simplify the Cisco CallManager administrative changes during the migration. Lastly, if you are a Unity user in North America, we added your full 10 digit number as an alternate extension. This is based on your North American dial plan number, which includes the area code. This extension was added to Unity for call forwarding scenarios into voicemail. To make more messages result in voice messages being left as identified subscriber messages rather than outside caller messages. After you've logged into Unity and you want to address a message to another subscriber. You can use any of the set of extensions that are provisioned for the user based on their location to reach that subscriber. In other words, if addressing a message to a San Jose user, you can use five digits. If addressing someone else in the United States, you can use 10 digits. If addressing anybody, you can use seven or eight digits. Granted, most people would just use the minimum number of digits, which is seven, that is globally unique. Most use a seven digit voicemail IDs in the Cisco directory didn't change as a function of this migration. However, there is a subset of users, those at sites who are going to get a new site code. That needed to have their voicemail field in the Cisco directory change so it didn't overlap with some users at a larger site.

CHALLENGE: MAINTAINING AVAILABILITY OF NETWORKED VOICE MAIL TO ALL USERS DURING MIGRATION

For a customer who has a single site and/or a single voice messaging system. Migrating all of the users at the same time is frequently possible and recommended. However, given the scale of the internal deployment with about 45,000 mailboxes globally to migrate a global flashcut was not a viable solution. It would have caused a spike in day two support cases and further delayed migration off the Octel systems. Since everything would have had to have been built and configured prior to the cut over. The amount of CallManager administrative changes would have been too daunting for the 256 sites we have globally as well. So we picked a migration approach that focused, not only on not interrupting the voice messaging networking service. Since that was a key feature for our company's senior executives and sales force in terms of being a primary business communications tool. Our challenge then became how to determine the best migration strategy from Octel to Unity by leveraging the Unity Bridge product. To provide as high of a network message service level during their migration period. We set the service reliability bar at no more than 5% non-delivery of messages during the week. Ignoring a couple of operational errors, the Unity Bridge product was able to consistently exceed this goal with the average rate being close to 3-4% of non-delivery messages. With over 10,000 messages being transmitting through the Unity Bridge servers on a weekly basis, our non-delivery rate was exceptionally good. When we looked at the source of the non-delivery of voice messages we found that the normal reasons. Such as a user's mailbox not existing or that mailbox being full since they're out on extended absence, applied. In summary, Unity Bridge networking proved to be as reliable as what we had before with the Octel network. And it exceeded our own expectations from a service level perspective. We decided to take advantage of Unity Bridge's name capability. To be able to synchronize a very small portion of the directory information available between the Octel and the Unity systems. We retrieved all the recorded voice names from the Octel system users so that the Unity subscribers would hear the recorded voice name. As confirmation when addressing network voice messages to users on the Octel systems. Some customers may have the option of using VPIM to migrate if they had an Avaya interchange server or other competitor's voicemail system deployed. Since Cisco IT didn't have an Avaya interchange system, it wasn't considered as an option for the migration solution.

CISCO VOICE MESSAGING ENVIRONMENT

This is what our voice messaging environment within Cisco looked like when we started the program. We had Octel servers spread all over the globe. There are two types of Avaya Octel systems that we replaced, Arias, which are in the US and Canada, and Serenade systems, which are found everywhere else. The Americas, Europe, Middle East and Africa theaters were significantly decentralized with their voice messaging systems. While Asia-Pacific, India and Japan had a higher degree of centralized voice messaging.

CISCO VOICE MESSAGING ENVIRONMENT: UNITY MIGRATION

The Octel systems were replaced with Unity systems in all these locations, which were primarily data centers with a few exception sites. In San Jose, there were 18 systems, 16 Unity systems for campus users, 1 Unity system for IPCC users or contact center agents. And 1 Unity Bridgehead server, and 4 Unity systems for centralized sites in the western part of the United States. In Boxborough, there were four Unity systems, in Research Triangle Park, there were five Unity systems, in Richardson, there were two Unity systems. One of the main challenges we ran into, which was fairly uncommon, is that we had no good idea of what our voicemail traffic was. Most customers can provide that information so that you easily can size the system and/or the number of servers you'll need to replace your Legacy voicemail systems. Due to the nature of how we contracted our voicemail services with Avaya, accurate voicemail port utilization information wasn't available to us. So we did the next best thing, we did some indirect analysis of the phone traffic from the PBX systems and guessed how this would translate to voicemail traffic. Needless to say, we over provisioned even our largest corporate sites. For instance, there were 4 Octels with 144 ports each servicing the San Jose campus. Rather than deploy eight 72 port Unity systems initially, to have port equivalency, we conservatively deployed 16 Unity systems. Now that we know the voice messaging system port traffic, we've consolidated down to eight systems in San Jose. So that the voice operations team has fewer Unity servers to manage going forward. One last point is that we also didn't know how widely the Unity inbox application would be used. This is the web browser client that is used to access your voice messages from your PC. What was surprising is that we have seen evidence that the deployment of Unity inbox has had a similar

result. As happens when a customer deploys Unity as a unified messaging solution voice port utilization plummets. Most casual users of voicemail stop using their phone to access their voice messages all together and rely solely on their PC to access voice messages. Thus the deployment of Unity inbox is also another reason why further Unity system consolidation was warranted.

CISCO VOICE MESSAGING ENVIRONMENT: DURING MIGRATION

Let's review some of the technical details of how the voice messaging network solution worked. There are five different voice message transport protocols that come into play with our solution. The black lines represent the digital protocol for how voice messages are sent between Octel Serenade servers. The solid red lines are how messages are sent between Octel Aria servers. The dashed red line is the Aria analog protocol; it is what the Arias use to communicate with the Serenade systems. It was also the key to our migration since it is what Unity Bridge uses to communicate with either type of Octel system. The green line is the VPIM protocol, which is a digital protocol for how voice messages are sent between the San Jose-based Unity Bridge servers and the Unity servers. This can be in any of the data centers around the globe. VPIM stands for voice profile for Internet mail. Lastly, the blue line is Unity digital networking protocol, which really is Exchange servers using the SMTP protocol. Now let's look at a couple of message flow scenarios.

MESSAGE FLOW DURING MIGRATION: HENDON TO SINGAPORE

If an Octel Aria user in Herndon, Virginia in the United States wants to send a network voice message to an Octel Serenade user in Singapore. Then the message flows as follows. First, it travels via the Aria analog protocol to the Serenade Octel in San Jose. This Gateway server receives the voice message using the Aria analog protocol and then retransmits it using the Serenade digital protocol to the Singapore server. Only a selected number of US sites, less than a dozen, use this Gateway server to avoid analog transmission problems to most other countries. Most sites in the US actually make analog calls directly to the Serenade servers in the different theaters. Some of these calls route over the international PSTN and some route over Cisco's voiceover IP Internet protocol network.

MESSAGE FLOW DURING MIGRATION: SYDNEY TO SINGAPORE

In the next scenario, a Unity was deployed at the Sydney office in Australia. A Unity user there wants to send a network voice message to an Octel user in Singapore. We deliberately chose to put all the Unity Bridge servers in San Jose for just this kind of situation. The Unity and Exchange servers for the Sydney users are located in the Sydney data center. Conceptually, the message flows from the Unity Sydney server via VPIM to the San Jose-based Unity Bridge server. This ensures that the message is traveling digitally over the greatest distance. Then an analog call is made to the San Jose-based Serenade server. This is the only brief time the message isn't transmitted in digital form. It also creates a single analog voice path that we need to ensure is available and reliable rather than managing multiple paths into and out of the United States. The Serenade Gateway server forwards the message back to the Singapore user via the Serenade digital protocol. Thus all networking is digital into and out of the San Jose data center from systems outside of the US and Canada. This worked very reliably and quickly. In some cases, we had users tell us that their messages between sites were delivered even faster than what they had had before.

SOLUTION: CISCO UNITY SOLUTION COMPONENTS

Now let's take a look at all the different point products that played a role in our solution. There are primary and secondary Unity servers deployed to form a redundant Unity system. There's a single Unity Bridgehead server to act as a single point of administration for all of the Unity Bridge subscribers. There are CallManager clusters, but no Legacy PBX switches that we needed to integrate with. There were Windows 2000 domain controllers with active directory global catalogue services providing a single shared directory for users, distribution lists and site codes. There were Exchange message stores and routing servers, a couple of IP IVR servers for San Jose and RTP to provide SNAMUS. This stands for single number access to multiple Unity systems. It turns out, if we had deployed Unity 4.0.4 later instead, we wouldn't have even needed this application, since that version of Unity provides cross box signing capabilities. We're getting rid of this application when we upgrade to Unity 4.0.5, so you can ignore it from further consideration. Lastly, a fax server was also provided for an investor relation's application in San Jose.

SOLUTION: CISCO UNITY GEOGRAPHIC DISTRIBUTION

For some sales sites in the US, which have relatively large numbers of users, say, greater than 200, they have a CallManager cluster at the site's location. Their Unity server's located in the centralized data center and is frequently integrated with several such remote CallManager clusters. As well as the CallManager cluster in the data center. Cisco IT centralized Cisco CallManager in the data center locations either previously or concurrently with the site's migration to Unity. Centralizing Unity systems that integrate with Cisco CallManager and providing SRST or survivable remote site telephony. Offered improved voice messaging availability in the event of a wide area network failure. The G.711 CODEC on Unity was selected to share the best possible voice quality. Transcoding for the WAN is done by CallManager-related hardware resources, not the Unity system. Now that we are done with the program, all of the Unity servers in the data centers will view all of the CallManager clusters. As effectively one big network switch due to the redirected number ID service or our DNIS connection between the CallManager clusters. This will lay the foundation for future Unity 4.0.5 voice messaging integration features for our global user communities that just aren't available. Or cost effective with Legacy non-IP telephony environments. Global capabilities for identified subscriber messaging live reply and auto attendant transfers via our voiceover IP network and IP telephony solution. Are our examples of what's to come in the future.

SOLUTION EXAMPLE: SAN JOSE DATA CENTER

Every point product that was part of the solution is redundantly deployed with a couple of deliberate exceptions. The Unity Bridgehead server plays only an administrative role for sites migrations. It doesn't answer any phone calls or home any Unity subscribers, so only a single instance of it was deployed. We also chose not to deploy Exchange clustering or SAN support. Since this deployment is intended to be just the first step to unified messaging where Cisco IT Exchange deployment has those kinds of redundancies. So we chose not to spend the additional dollars on that technology for this program. The Unity Bridge servers can be quickly and easily reconfigured to spread the traffic load if one server was to go down, but we never needed to do that. We also had a spare Unity Bridge server if we needed the hardware as well as spare servers in each data center that can be tasks as either Exchange or Unity systems.

SOLUTION: ARCHITECTURE SUMMARY

In summary, our solution allowed us to remove 184 Avaya Octel systems. We reduced the number of voice messaging systems by over 75%. As of now, we've replaced them with 41 Unity systems and have consolidated systems to 92 fewer locations.

SOLUTION: MIGRATION SUMMARY

We migrated over 45,000 mailboxes in about a year's time. We centralized 256 Cisco sites. Unity Bridge systems transmitted over 110,000 messages between Unity and Octel systems. With so few errors that we were in the noise level in terms of non-delivery receive rate of 3-4% on average. We did this while maintaining an excellent professional relationship with Avaya who had to make configuration changes on their Legacy Octel network in support of our migrations.

SOLUTION: TRAINING SUMMARY

Training reports indicate that most people took the training several weeks after their site was migrated rather than before it was migrated. Even though training was available prior to the system enrollment period. The average user didn't need training, but people who use voice messaging a lot, such as administrative assistants, found it valuable.

SOLUTION: COMMUNICATIONS SUMMARY

An effective communication strategy with your customer's power users of voice messaging. Is one of the top three most important things you can put in place to ensure that the migration and adoption of Unity goes well.

PROGRAM UNITY ROI OVERVIEW

We reduced our annual support costs by \$4 million, which translates to a month per mailbox reduction of 62% for our managed service offering. We replaced 184 Octel systems with 41 Unity systems, globally. The actual migration period was 13 months from July 1, 2004 to July 31, 2005.

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Now we'll discuss some of the questions associated with this project.

Q. The first one. When did Cisco IT start planning for the Unity deployment, why did it take so long, and what can I do to avoid it taking such a long time?

A. Well, it took us about a year's worth of planning and a year's worth of execution. As we were doing some of the planning and better understanding our requirements and the needs of our end users. We determined that we actually needed a later version of the Unity Bridge product, so that was one of the things. This was the largest migration and deployment of Unity to date. So we actually spent quite a bit of time developing materials that would feed into our training. And our deployment processes to really let the migrations scale quickly and rapidly around the globe. And the last thing is that we were able to package this information in such a way that customers will be able to leverage this information as well.

Q. Second question. What did you notice in terms of the trends in the types or amount of support cases as a result of the switch to Unity?

A. Well, our support case load decreased. The mix of cases changed, meaning we had more cases that went to our helpdesk that were of the nature of training, Q/A. But less cases that required our more experienced tier 3 Engineers to be involved to solve. The other thing that we saw was that the end user customer satisfaction numbers didn't vary from going from Octel to Unity, so they were essentially equivalent. Next question. Are the lessons learned from your internal deployment shared with Cisco's advanced services team? Such that my company can contract with Cisco's advanced services team to benefit from these experiences? Yes, we worked to mine the program data and create document templates that would cover things like how to install. And configure the systems, how to put together a communications or training plan. And this information is available to our advanced services teams for deployment or our Unity managed service team for day two support.

Q. Next question. What can people do with Unity that they can't do with the Octel system that we were using before?

A. Well, one of the most noticeable changes was that with Unity, there really is this web browser client that has a different way of using the system. Through the web browser client, people could access their voice messages. But more importantly, they could configure the Unity system to meet their own style of how they wanted to interact with the system. There was some concern of letting end users have this degree of flexibility, and would it, in fact, create more support cases. Well, the exact opposite happened. By empowering the end users to better manage and configure the Unity system themselves, there were less calls to the support desk. A common example is the telephone user password. If a user forgets their telephone password into Unity, they can use the web client to reset it themselves. And thereby avoid having to call the helpdesk, which typically is the number one support call for voicemail.

Q. Next question. Why did IT choose to deploy Unity voice messaging with the Unity inbox web client instead of unified messaging?

A. Well, at the time we were planning and implementing our voice messaging migration. Cisco IT was in a rather unique position of also transitioning to Outlook and Exchange for their e-mail system. Most large enterprise customers already use either Microsoft Exchange or Lotus, Domino and Notes. They tend to be the two predominant mail systems in the industry. Well, Cisco IT was in the middle of adopting Exchange as their e-mail solution. And rather than wait for that program to complete, or subject their end users to too much change simultaneously, we decoupled the two programs. And so that's why we didn't deploy unified messaging right away and instead offered the Unity inbox. The web client, as a means of accessing voice messages from their PC, initially.

Q. Next question. What are Cisco's plans to deploy unified messaging?

A. IT is actively doing the planning work for a migration to unified messaging. Such that end users would be able to use their mail client to access voice messages from their PC. That's all we have time for now.

MORE UNITY VOICE MESSAGING RESOURCES

I really glossed over many of the details of the architecture, the migration approach and the training and communications experiences. We have already published case studies for each of these topics. But I'd highly recommend, if you want more details in any of these areas. For more information on Unity, please go to the websites listed on this page. For more information on other Cisco products and services that we use every day. Please take a look at the Cisco at work website. On that site, you can find out more detailed information about Cisco IT deployments of the products and services we provide to customers. You can go to these sites to find out what we deploy what benefits we've gained. And what lessons we've learned, and how you can contact other experts in Cisco IT for any questions you may have.

CISCO SYSTEMS

Thanks, everyone. We'd especially like to thank those of you watching for spending the time with us. And being interested in what the global technology seminar series is all about. We hope you've enjoyed the show. Talk to you soon.



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