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What You Make Possible

TOMORROW starts here.

CISCO

Unified Communications and Directory Integrations

BRKUCC-2664

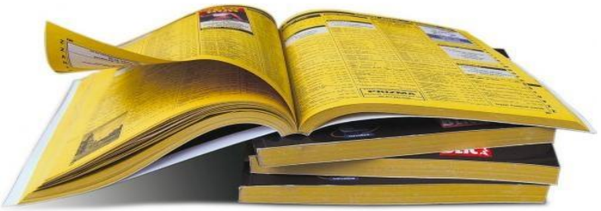
Agenda

- Today's challenges for directories and Authentication & Authorisation Services
- What is UDS?
- How Cisco Applications use directory services
- OpenAM and how to support SSO across different domains
  - Rely on Microsoft Kerberos implementation and use SPN
  - Create multiple Kerberos sync agreements from OpenAM with the KDC in each domain
- A broader view on Authorisation and Authentication services
- Key Takeaways and Q&A

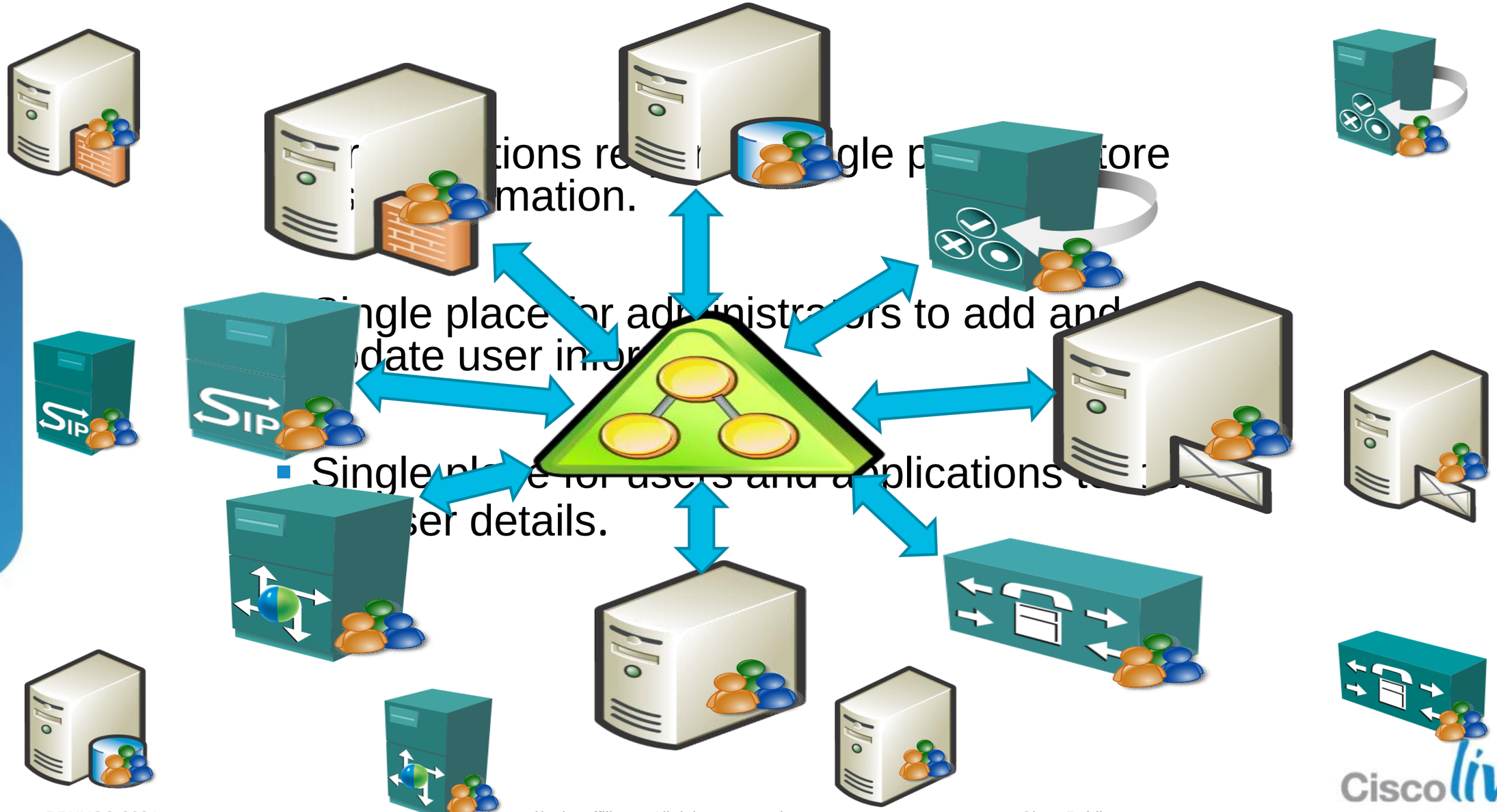
Today's Challenges for Directories and Authentication and Authorisation Services

What is a User Directory?

- A directory service is a publicly available database of structured information.
- The most common example of a directory service is your local White Pages - it contains names, addresses, etc.
- All information indexed for easy browsing and searching.
- The service can be categorised as 'write-once-read-many-times'.

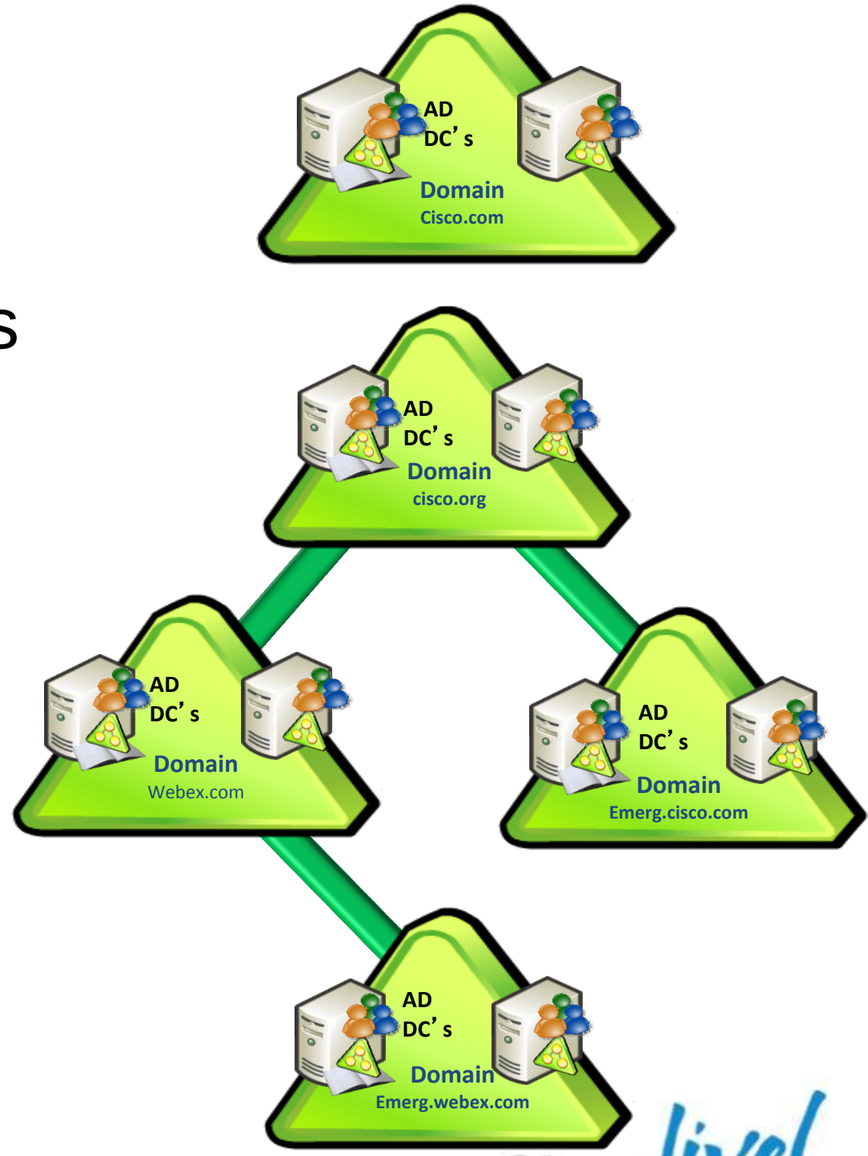


Where to Store the User Information?



What do we See in Organisations Today?

- Almost all the organisations already have an Active directory infrastructure.
- Organisations consolidate user passwords in AD, but they don't fully use it as a user directory source for other applications.



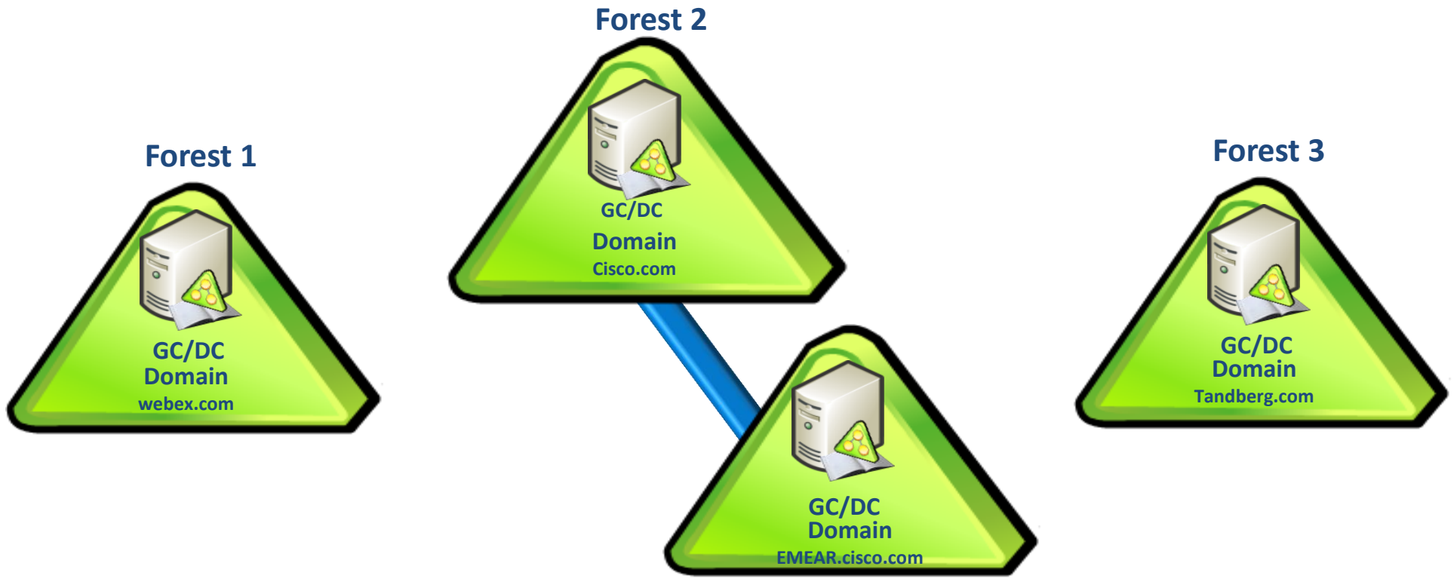
In the rest of the presentation we are going to cover different architectures to simplify the complexity of AD deployments

Check Appendix A for the Basic Concepts of Active Directory

But Sometimes it Gets Very Complicated

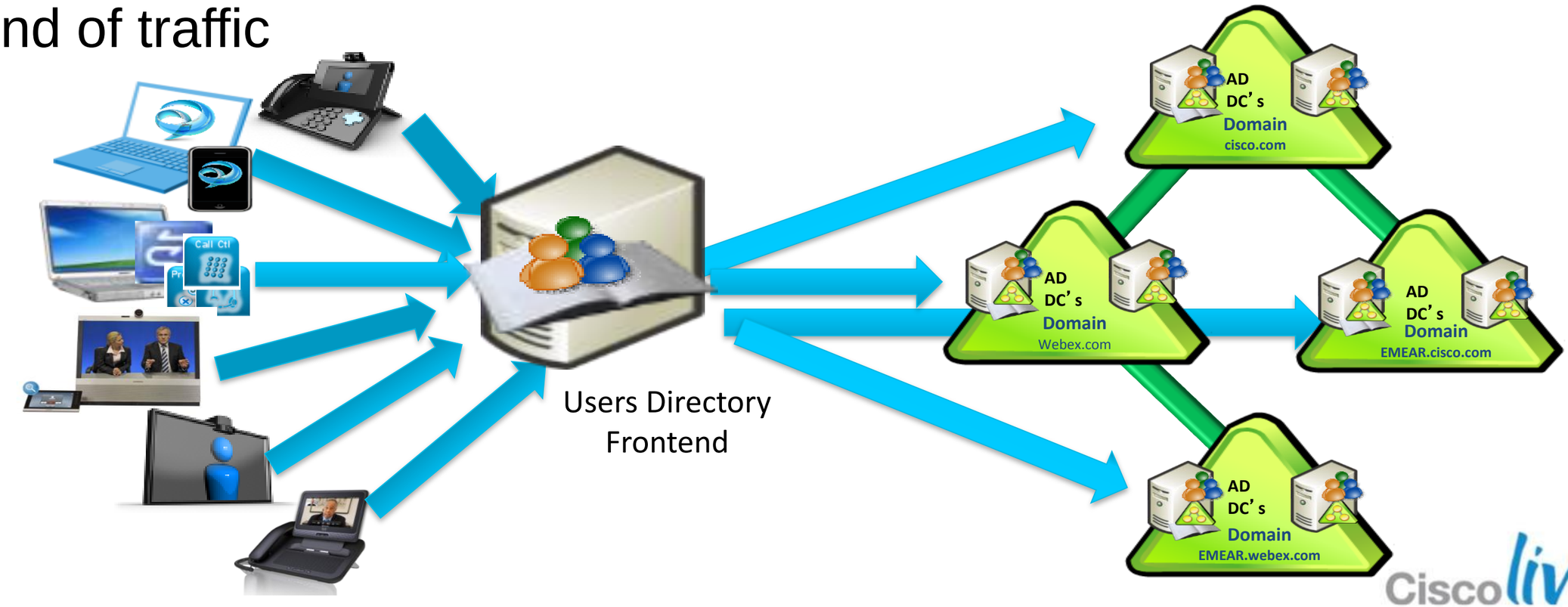
...

- Complex AD deployments that aren't prepared to consolidate user information in a single point of contact



Applications are Becoming More Dependent on User Directories

We start to have more and more applications that need to consult the LDAP database in every task that they execute…
That is **too** heavy for the AD DC's that aren't designed for that kind of traffic



Why Identity Matters

Improve Adoption

- Enable Eagle Vision
- Make it easy to integrate with enterprise identity customers with industry standards and tools
- Common Identity facilitates integration between products reduces onboarding and training time for new products

Reduce Cost

- Gartner estimates 20-50% of support costs related to password management
- Cisco IT estimates $250/user/year cost of password management
- Build features not security

Meet Security & Compliance Requirements

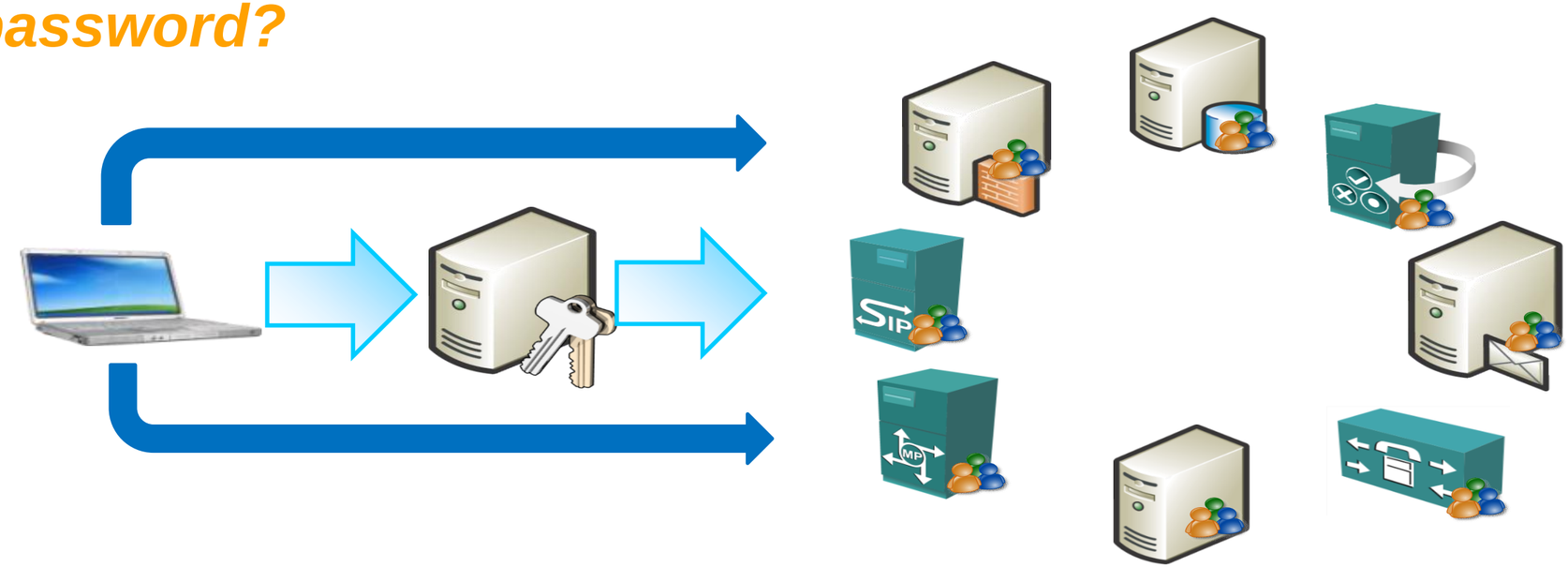
- Increasing threat vectors for enterprise identities
- Gartner Predicts: “By 2016, 40% of enterprises will make proof of independent security testing a precondition for using any type of cloud service.”

Users Want to Provide Authentication Only Once

With so many systems and applications that need user directory information and authentication…… Users are complaining more and more every day…

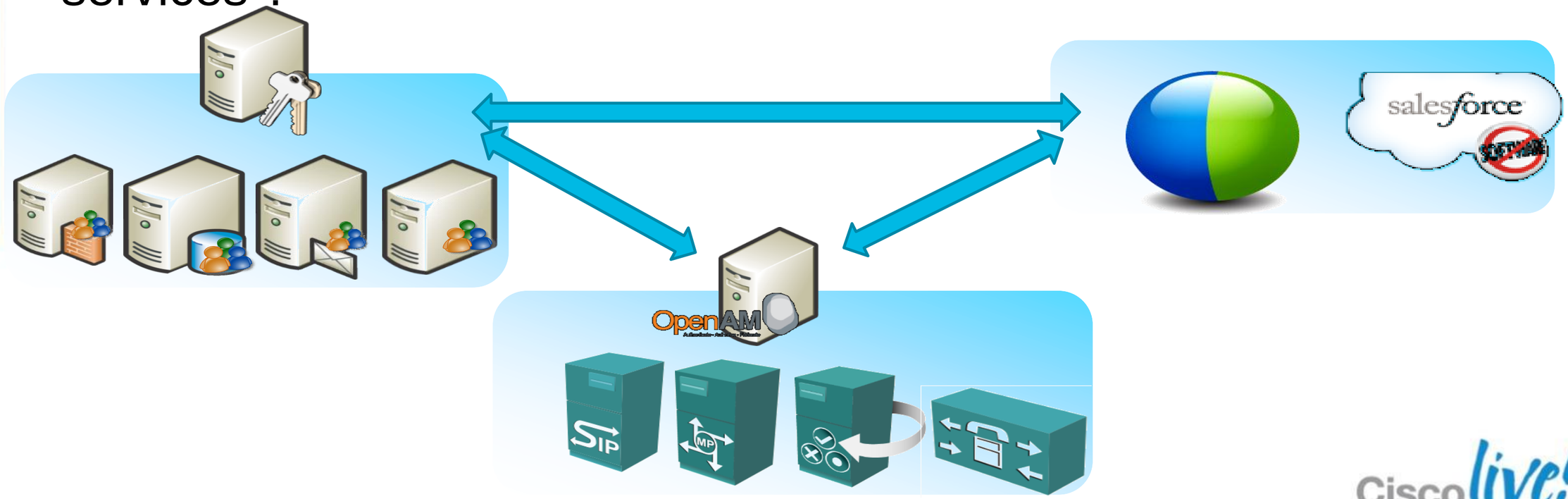
Why should I have to provide credentials in every system that I use?

Why do I need to update all the applications when I change my password?



Additional Authentication Challenges

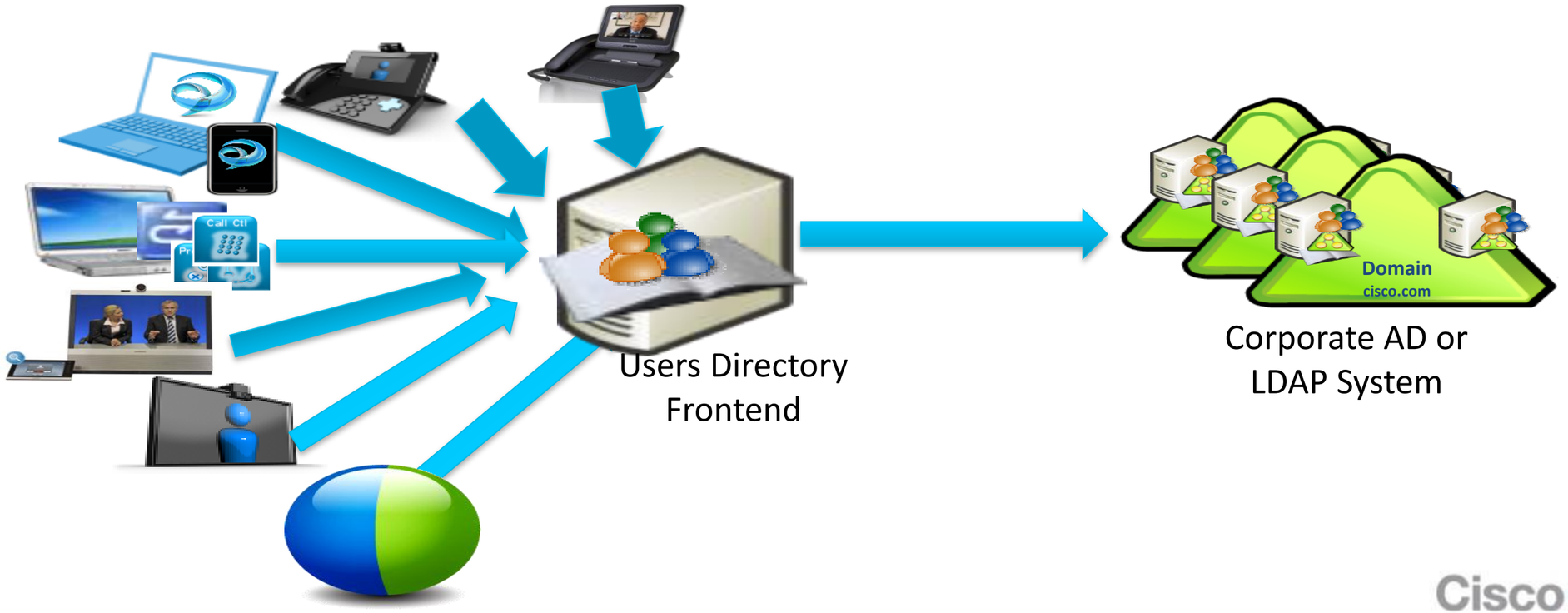
- What to do when the organisation already has an Identity and Access Management System ?
- How to bring Single Sign-On and user information to the cloud services ?



What is UDS?

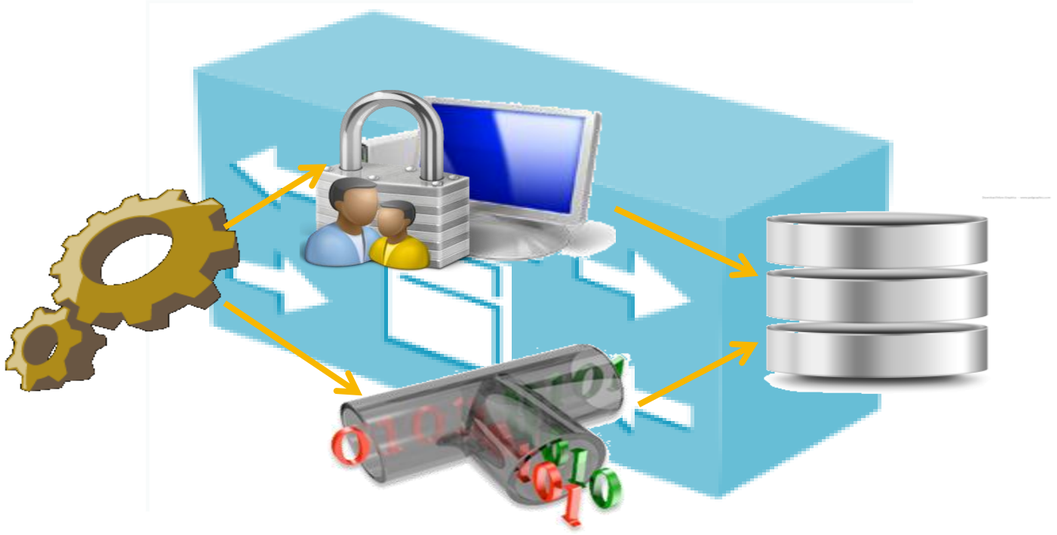
User Directory Requests

We start to have more and more applications that need to consult the LDAP database in every task that they execute… That is too heavy for the AD DC's that aren't designed for that kind of traffic ……and too even heavy even for an LDAP System.



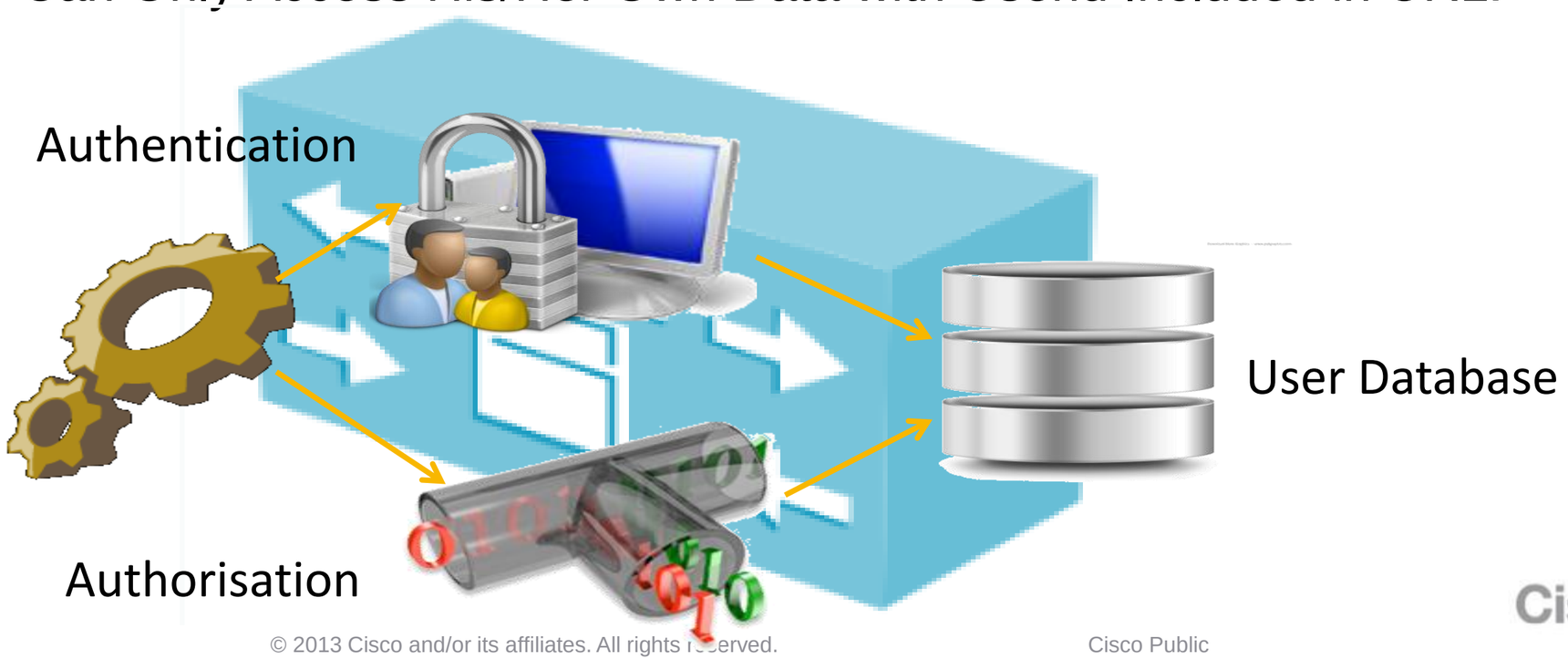
What is User Data Service?

- User Data Service is a new Cisco web service running on each Unified CM Subscriber (enabled by default) which facilitates the exchange of User-based information (e.g. Search and Single Sign On) for our clients.

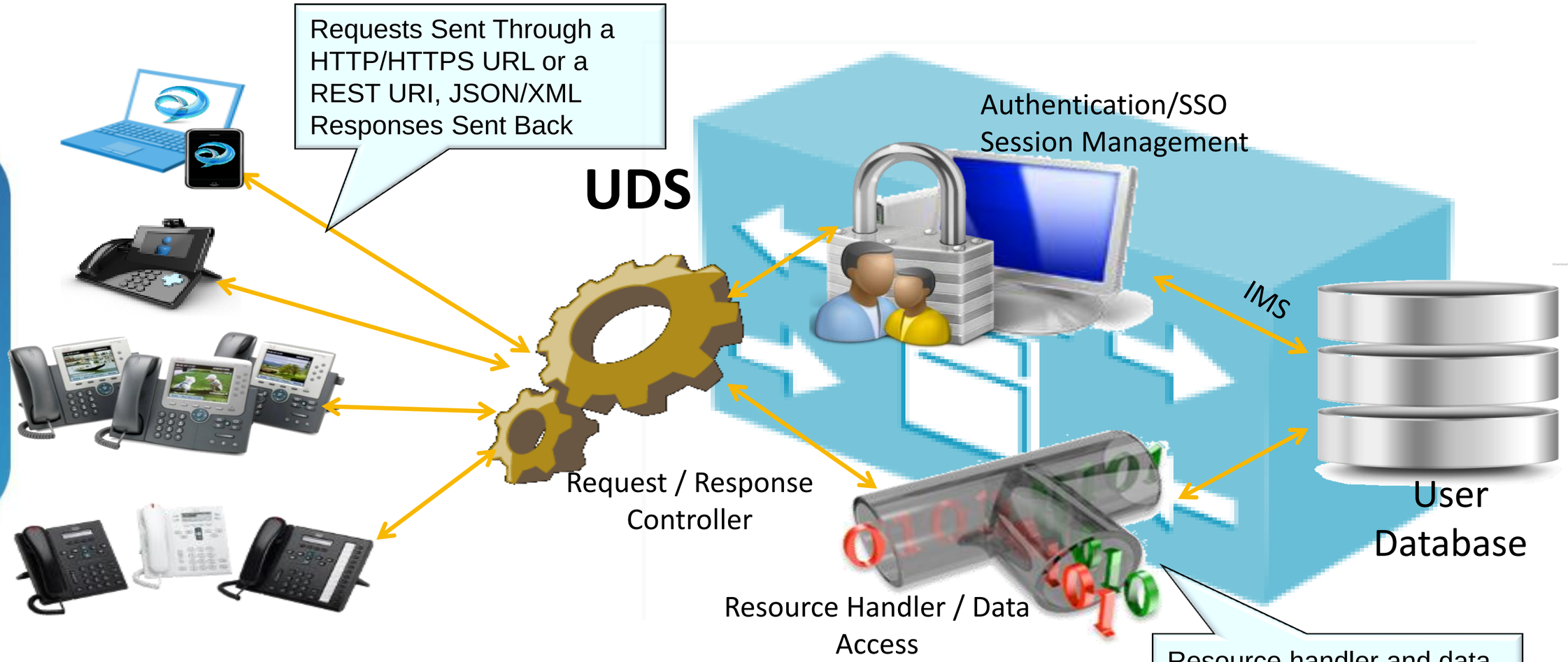


UDS Components

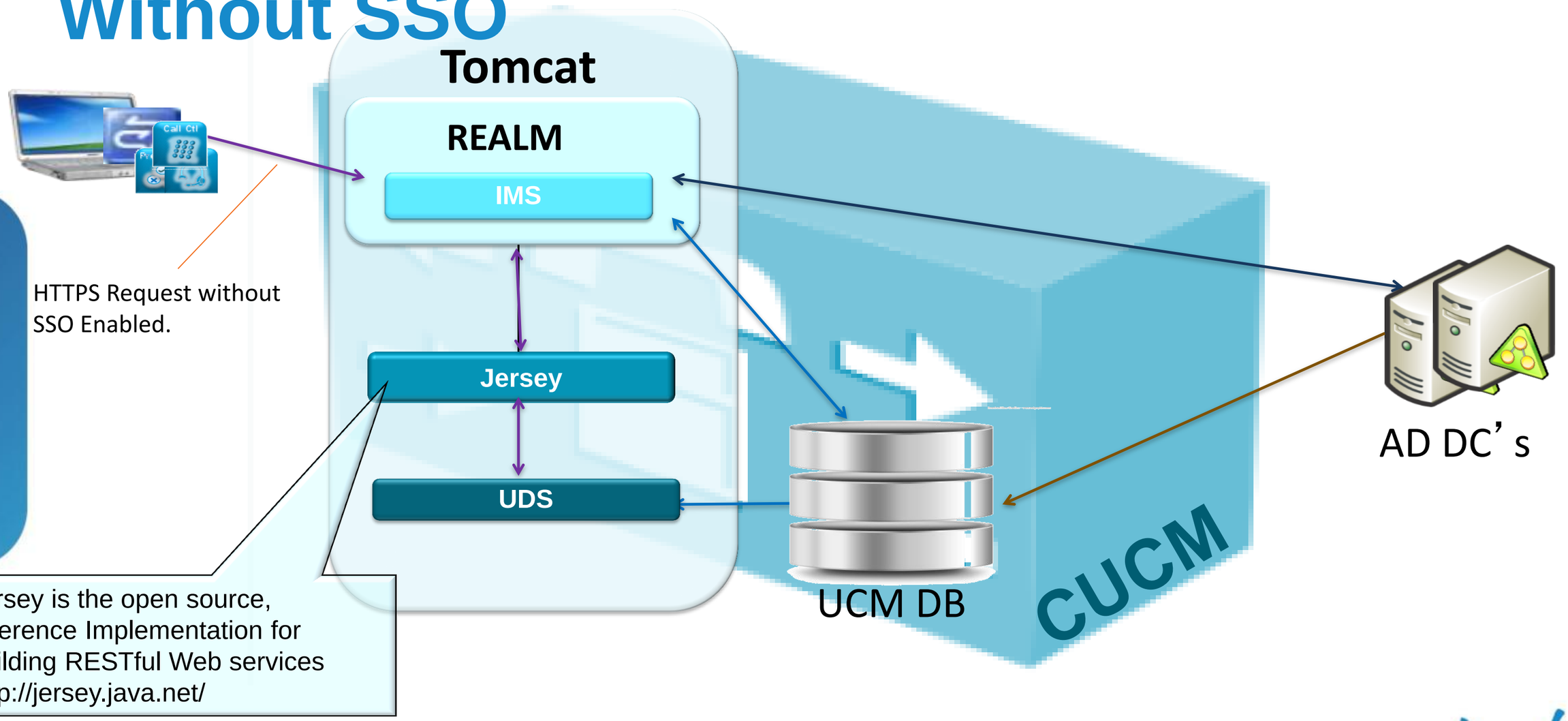
- Authentication
  - SSO (Bypass Authentication with Assumption Policy Agent Intercepts HTTPS Request)
  - Basic Authentication vs. IMS
- Authorisation
  - User Can Only Access His/Her Own Data with Userid Included in URL.



UDS Architecture

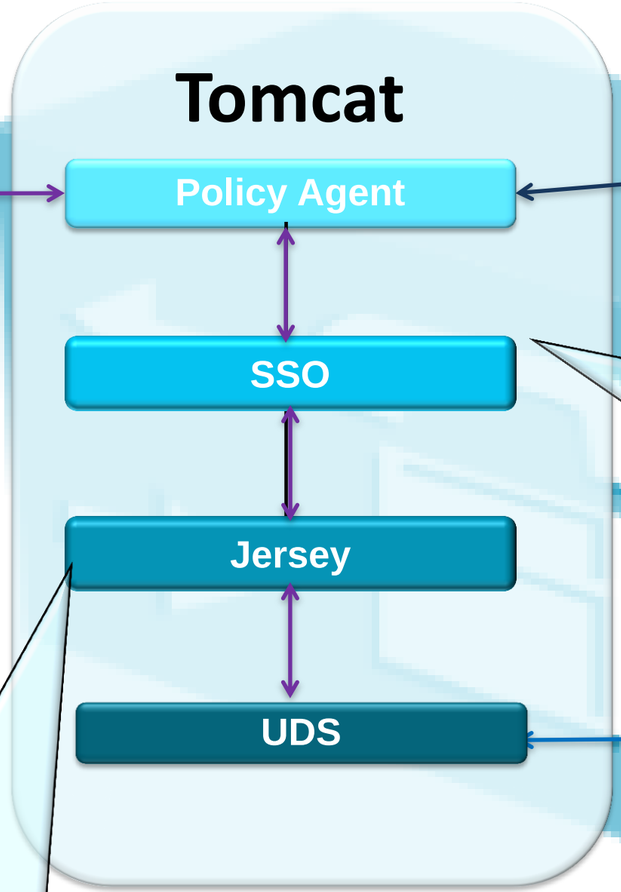


Authentication Components for UDS Without SSO

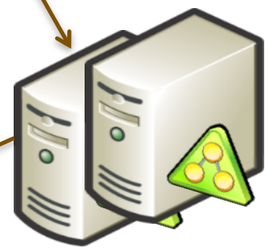


Authentication Components for UDS with SSO

1. HTTPS request only for SSO.
2. No Service Discovery Needed Here Since CUCILync gets CUCM node info from registry during initialisation



With SSO, request will not go through REALM, authentication will be bypassed.



AD DC's

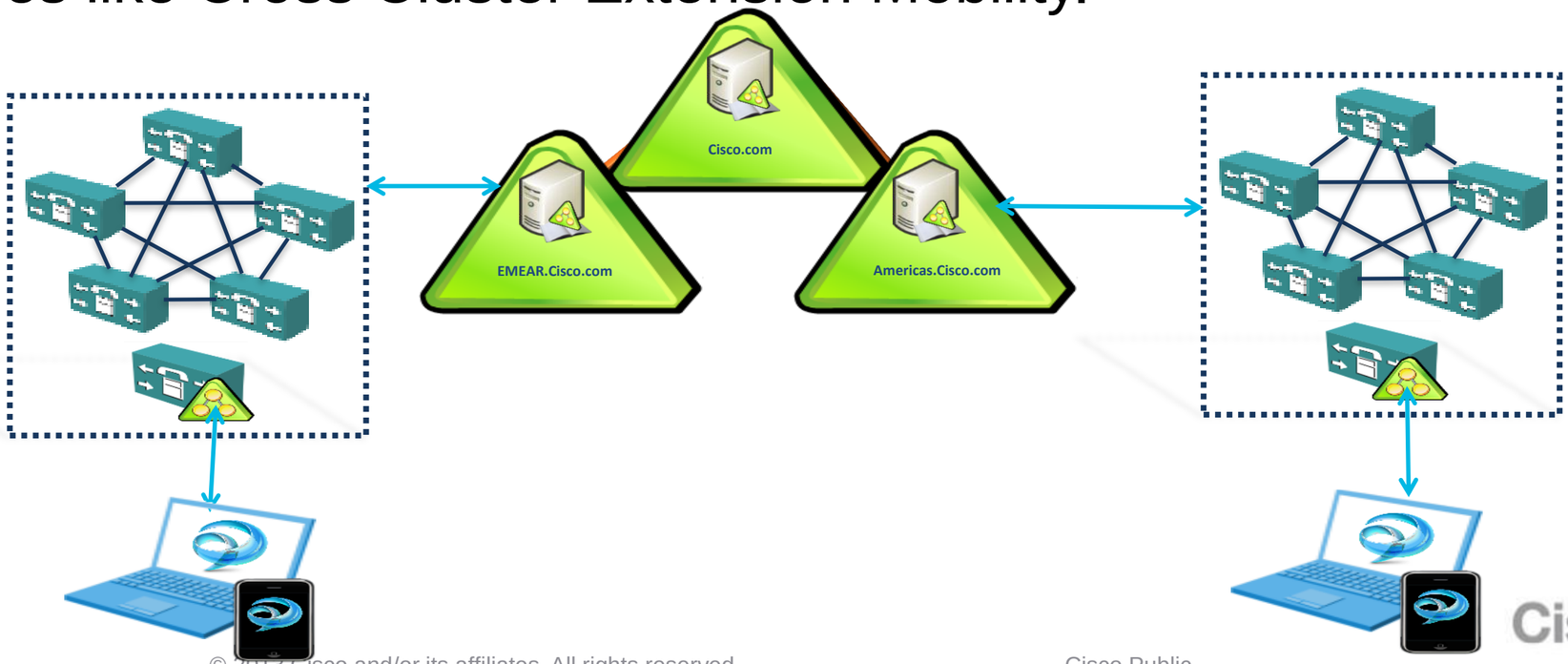
UCM DB

CUCM

Jersey is the open source, reference Implementation for building RESTful Web services http://jersey.java.net/

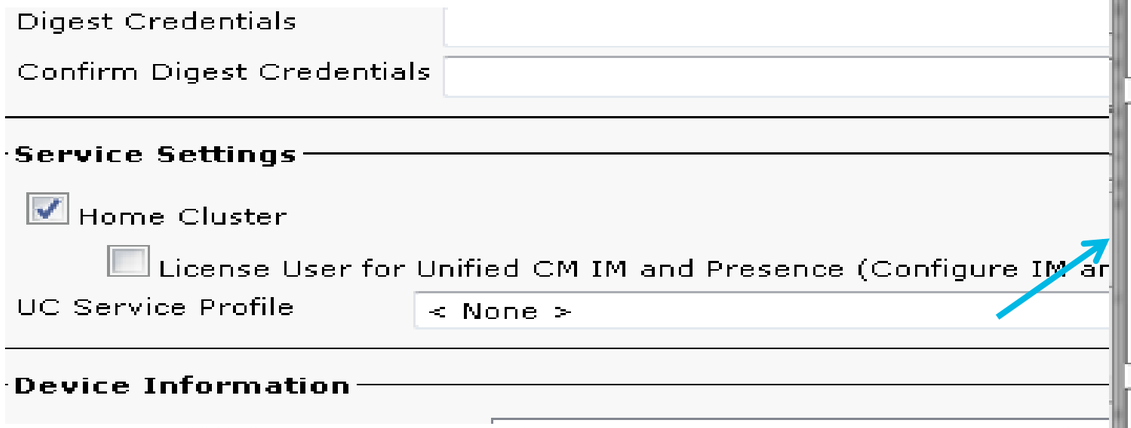
Directory Structure for large Organisations

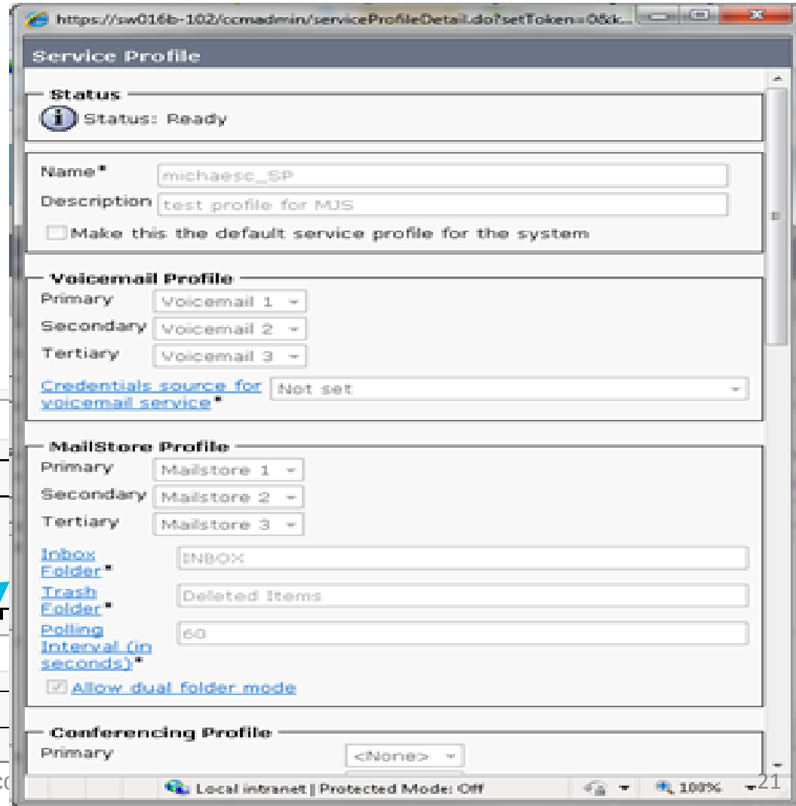
- Organisations with multiple clusters need to have one addressable LDAP entity/structure per cluster (OU, Domain, AD Forest), that means that each cluster has its own user information.
- User information from cluster to cluster is different, this is a requirement for features like Cross Cluster Extension Mobility.



Cluster and Service Discovery

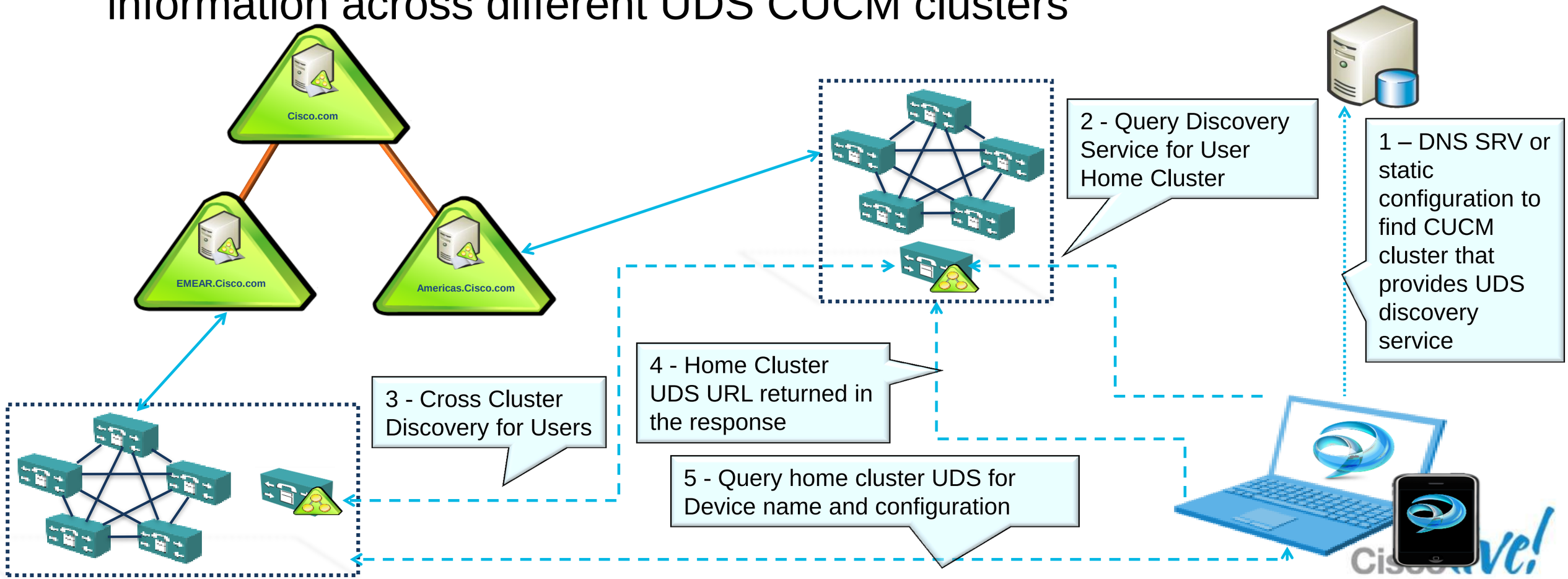
- Home cluster discovery is implemented using UDS (User Discovery Service) which allows the Jabber clients to locate their home cluster and configuration storage.
- A global instance of UDS finds the home cluster and the home cluster UDS finds the TFTP-served config file.
- Service discovery is the process whereby the 9.0 client retrieves the config file from the home cluster TFTP server, registers with the home cluster, and connects to all UC services configured for this user



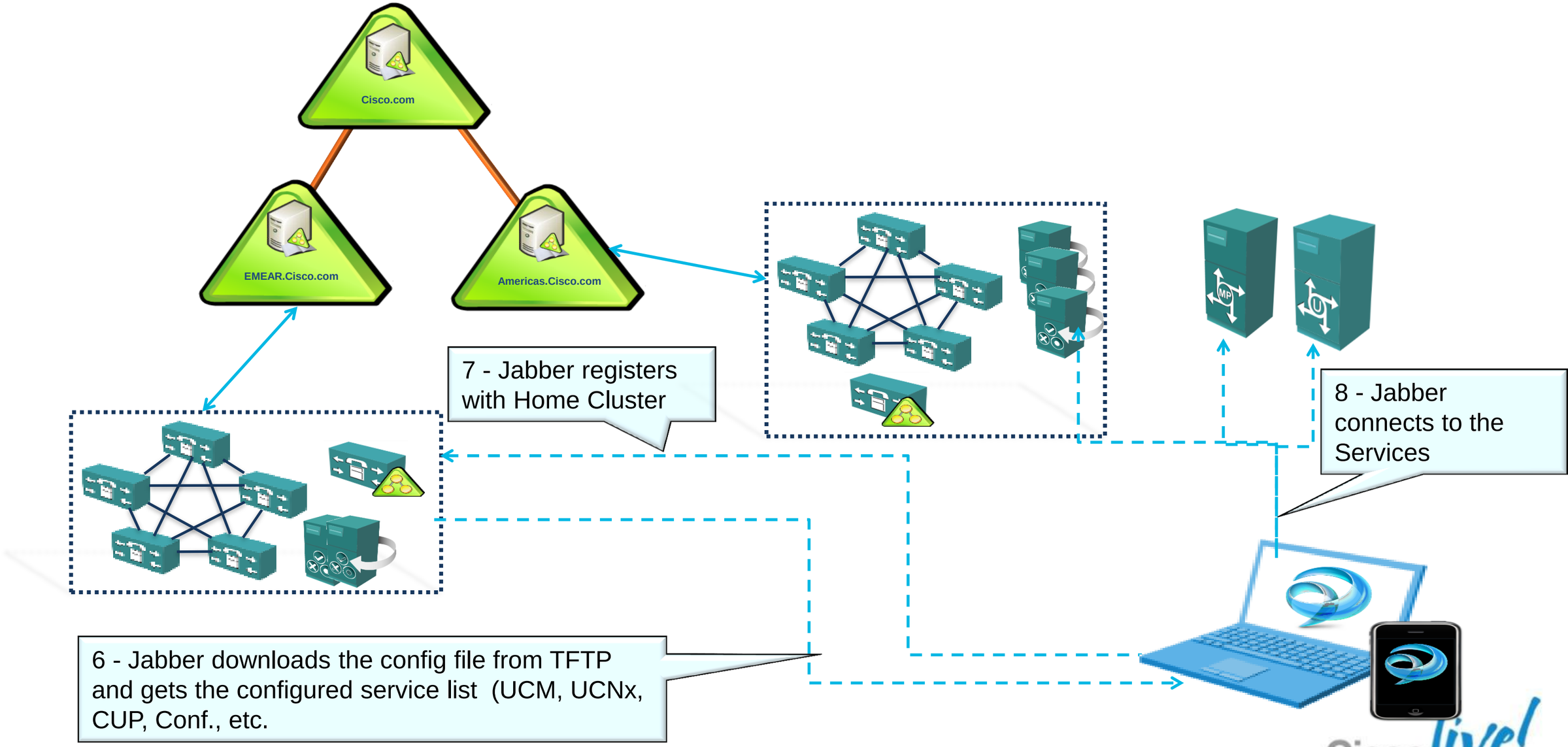


User Base Cluster Discovery

- The direction for UDS is to allow dynamic discover of the home cluster for a specific user, and to get information from users directory information across different UDS CUCM clusters



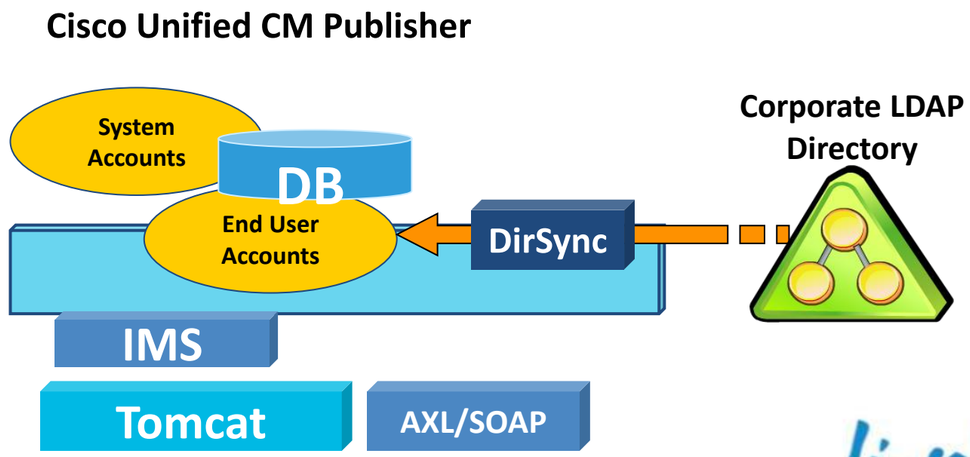
Service Discovery



How Cisco Applications Use Directory Services

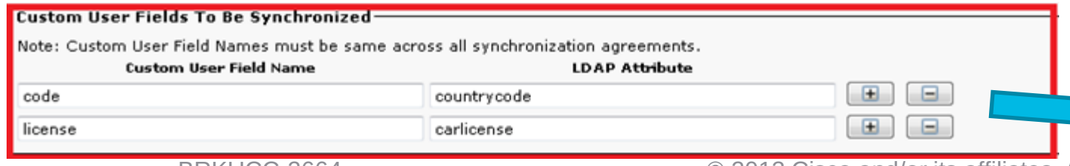
Performance and Scalability of User Directory Synchronisation in CUCM

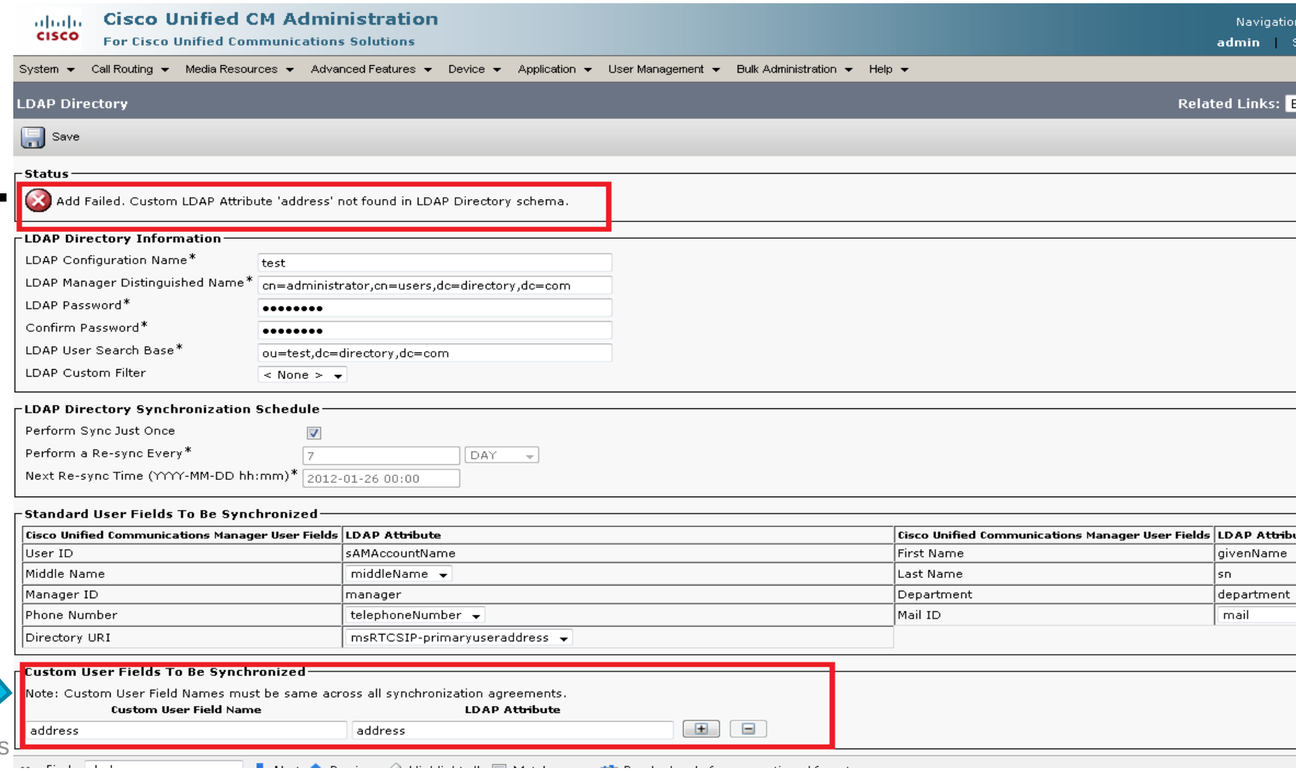
- Initial synchronisation for 60,000 User Accounts in Unified CM 7.1(x) takes roughly 30 minutes.
- Initial synchronisation for 60,000 User Accounts in Unified CM 8.0(1) takes roughly 22 minutes.
- Initial synchronisation for 80,000 User Accounts in Unified 8.6(1) or later takes roughly 19 minutes
- Subsequent synchronisation operations may take more/less time depending on the number of changes between synchronisation intervals.



Custom User Fields

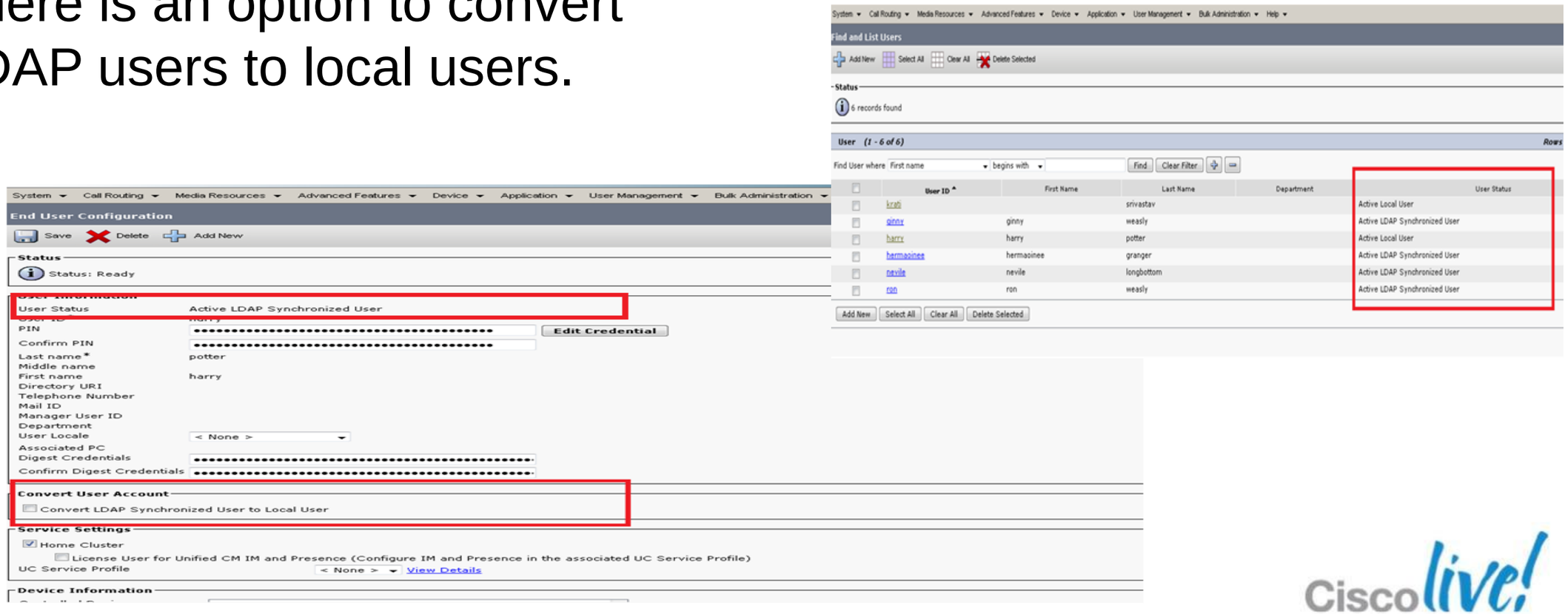
- In the current scenario there are 13 default attributes (hardcoded) which are syncronised along with the users.
- Custom User Fields are additional LDAP attributes which would be syncronised.
- Custom User Fields Names must be the same across all synchronisation agreements.
- Up to five Custom User Fields can be added.





Local Users and LDAP Synchronisation

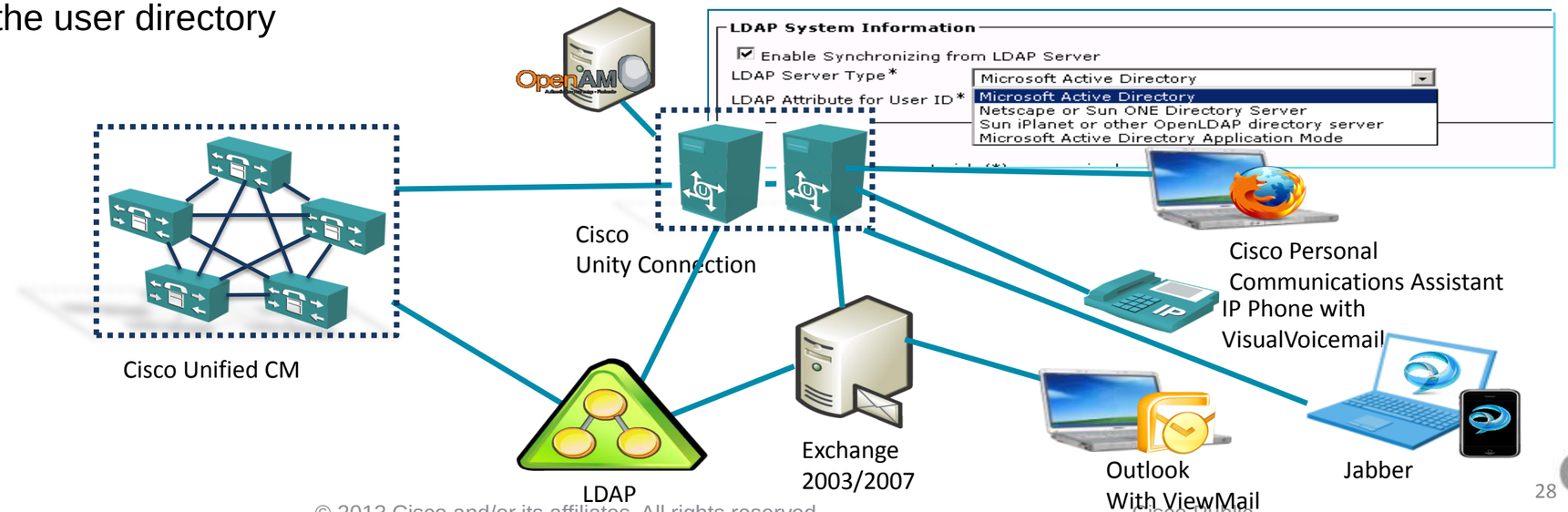
- CUCM 9.0 and later allows the simultaneous support for both LDAP synchronised and manually added end users.
- There is an option to convert LDAP users to local users.



Unity Connection User Directory Integration

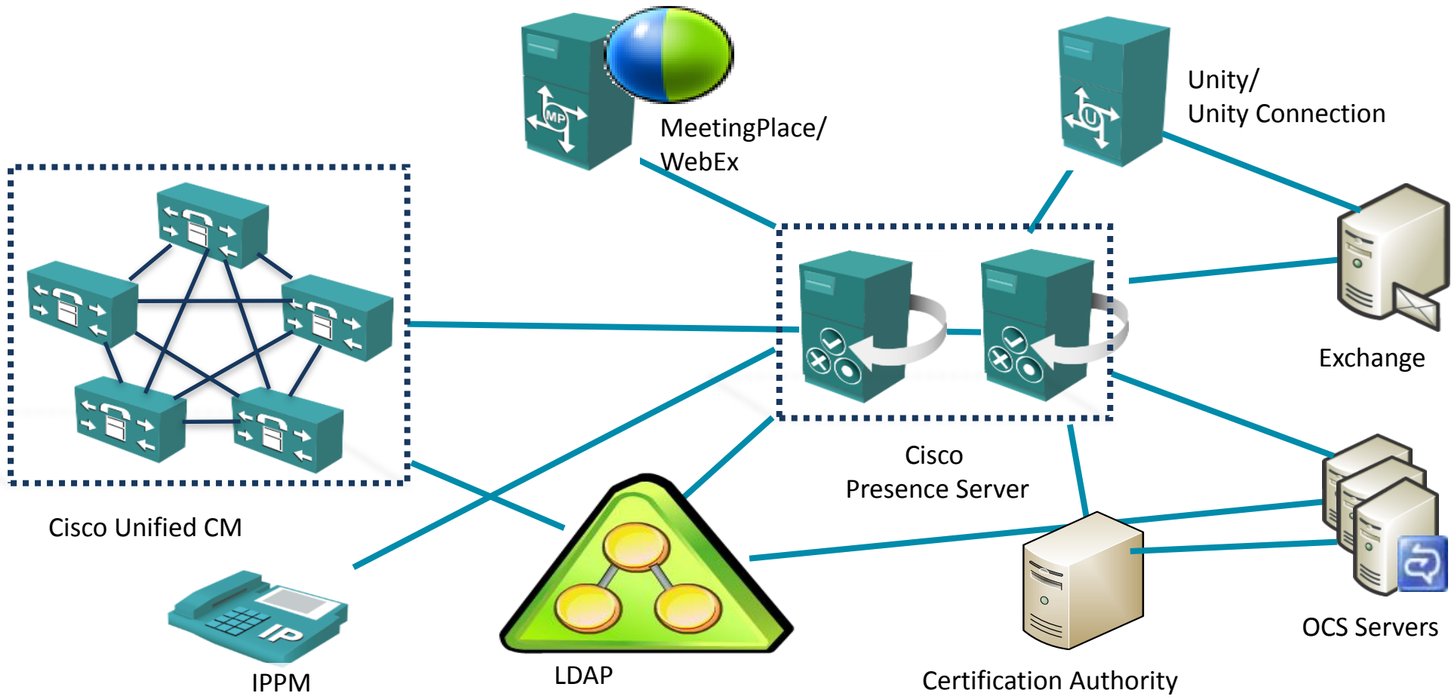
- Three approaches to integrate user directory in Unity Connection
  - Importing users from a CSV file to the Connections database
  - Getting the user from CUCM database using AXL/SOAP
  - Connection to an LDAP engine the same mechanisms and limitations discussed before in CUCM

Note: if you use SSO you need to choose LDAP for the user directory



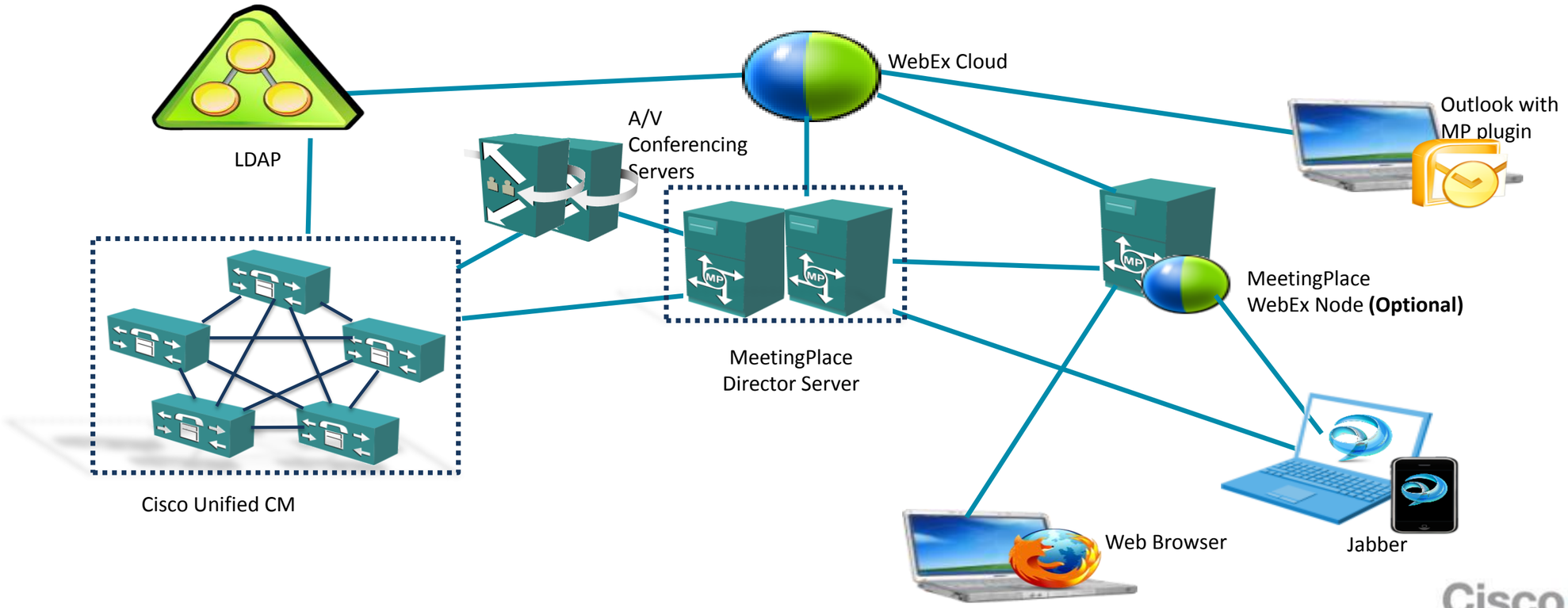
Presence Server User Directories Integration

CUP gets the user and password information from CUCM through the sync agent.



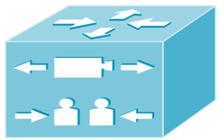
MeetingPlace User Directories Integration

- In version 8.5 everything changes ☺
- MeetingPlace recommended way is to synchronise on-premise LDAP source with WebEx and it will populate user information into MeetingPlace



Video Applications Directory Integration

- Two main products that consume user directory information and require authentication :
  - VCS (Video Communication Server)
  - TMS (TelePresence Management Suite)



- All the other products (Endpoints, MCU, Gateways, TP Server, etc.), can get it from VCS / TMS.

VCS (Video Communication Server)

Administrators

- Users can be provisioned locally or imported from an LDAP/S Engine
- User can be authenticated using local password or if LDAP integration is used, Basic or SASL authentication is available.

Endpoints Registration

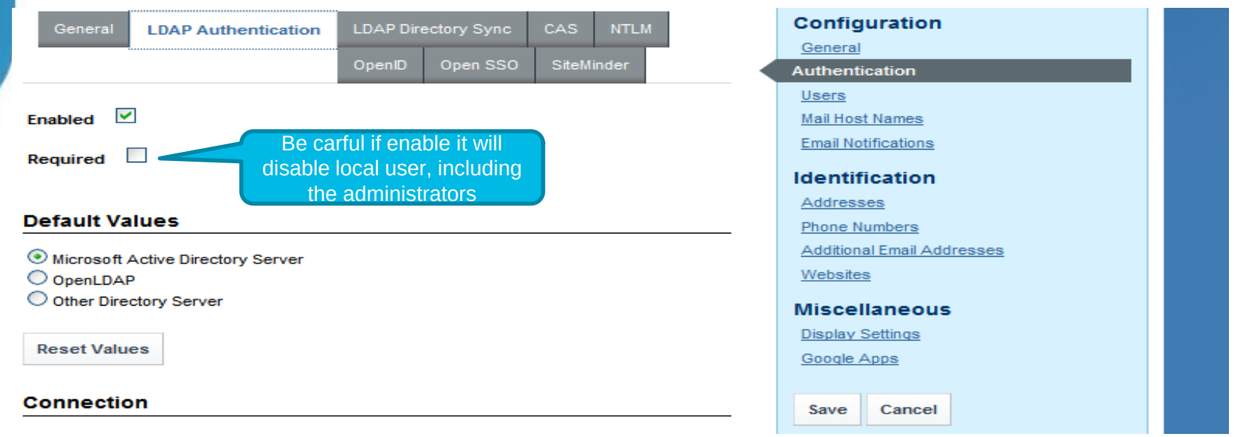
- User database can be populated from:
  - Locally added
  - Populated from the TMS database
  - Populated from LDAP/S including AD DC
- Users can be authenticated using the following methods:
  - Local Password
  - Through LDAP/S binding using SASL or basic passwords
  - NTLMv2

TMS (TelePresence Management Suite)

- TMS is part of a Microsoft domain, and uses IIS to provide interface to the users. So by default, without any additional administration configuration, user authentication is integrated with Windows logon.
- When users access to the Web Interface TMS will get the User details from AD GC using ADSI Libraries, and populate its internal database.
- User database population can also be achieved from generic LDAP/S synchronisation.
- Accepts different mechanisms for Authentication:
  - NTLMv2
  - AD Kerberos
  - LDAP/S simple authentication
- From the user information gathered from the different sources TMS is going to create the phone books for the endpoints.

WebEx Social LDAP Integration

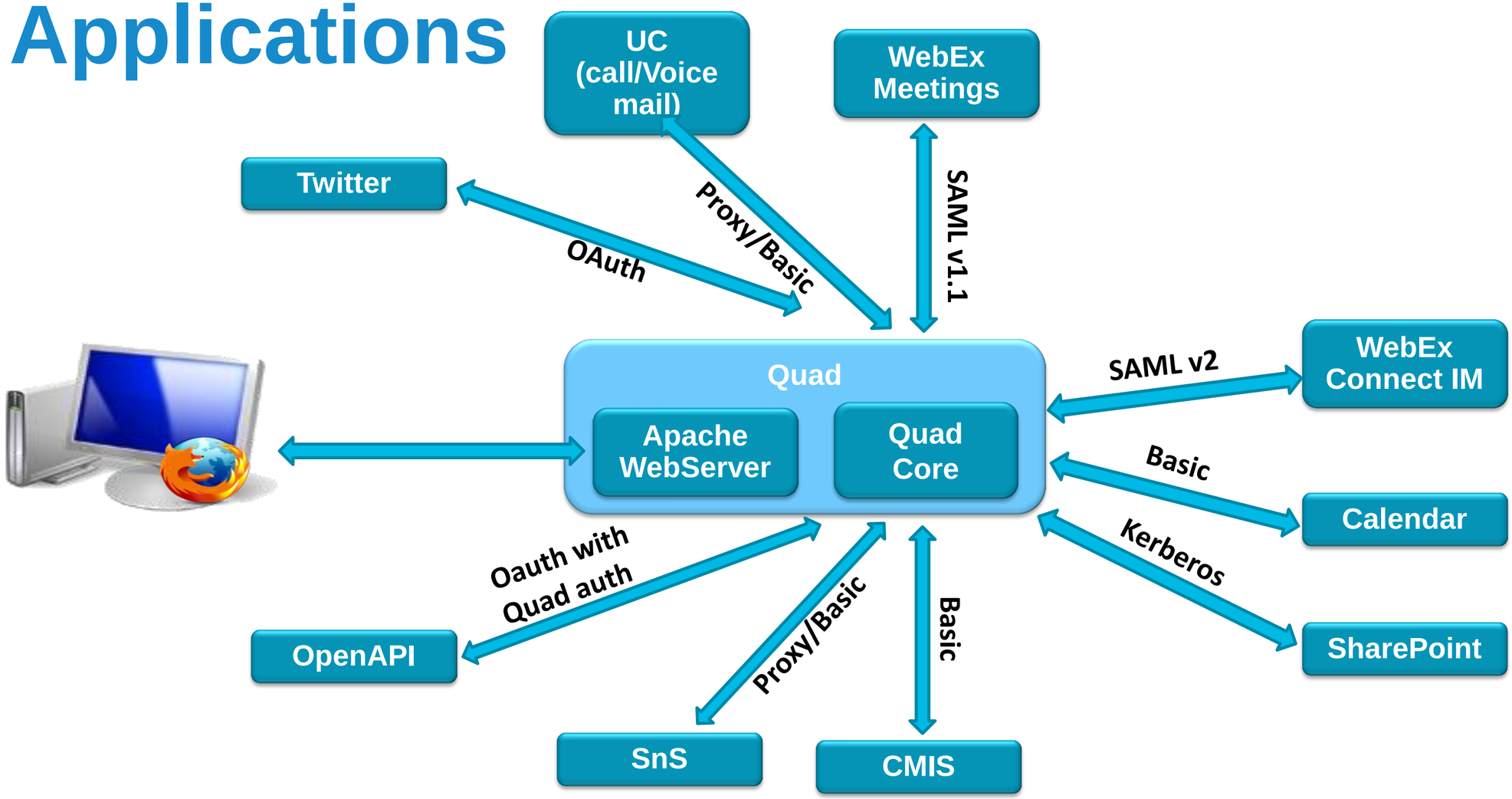
- There are two ways of integration with LDAP sources (AD, OpenLDAP):
  - LDAP Authentication - The WebEx Social user database will be populated with the details imported from the LDAP source when the user first logins to the system. Can be performed from "Quad" Nodes only.
  - LDAP Synchronisation – The WebEx Social user database will be populated at specific time and all the user that match the LDAP filter will be imported.
- LDAP and LDAPS methods are supported
- Users can be created locally as well as imported from LDAP source.



WebEx Social Single Sign-On

- WebEx Social supports NTLM version 1.
  - NTLM is a Microsoft protocol that can be used for authentication through IE & Firefox
- WebEx Social supports non-standard based SSO solutions – these are created as one offs and need to be customised:
  - CA Site Minder
  - Oracle access manager - OAM
  - Shibboleth
  - OAuth
  - Kerberos

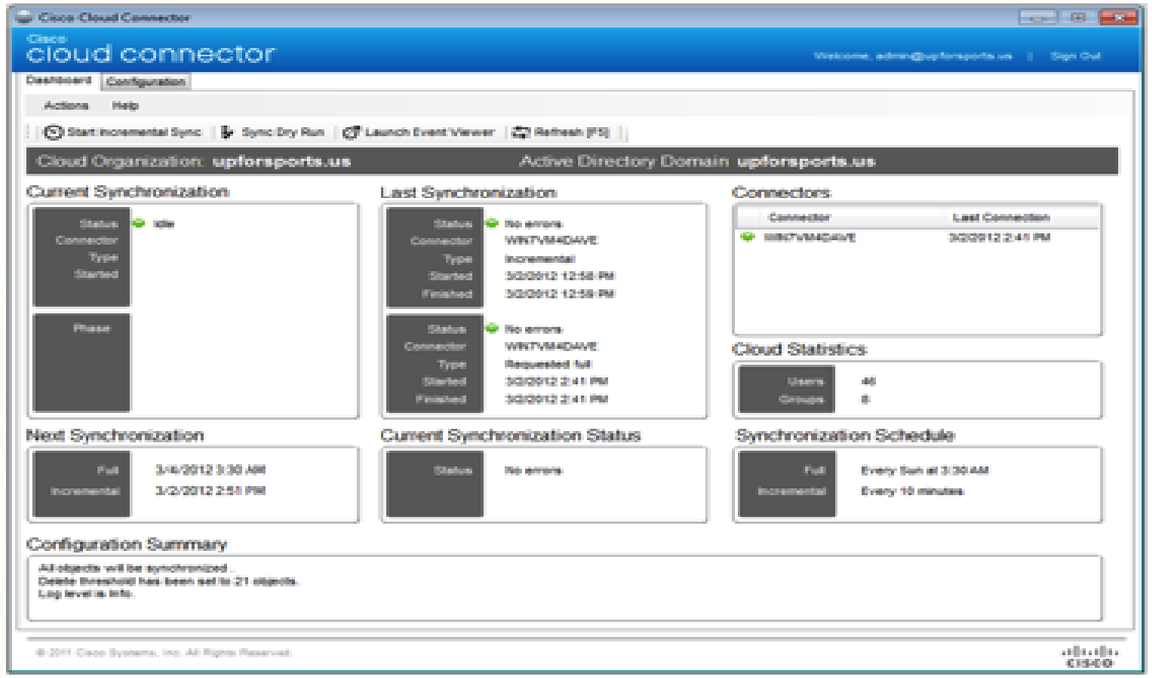
WebEx Social Authentication in External Applications

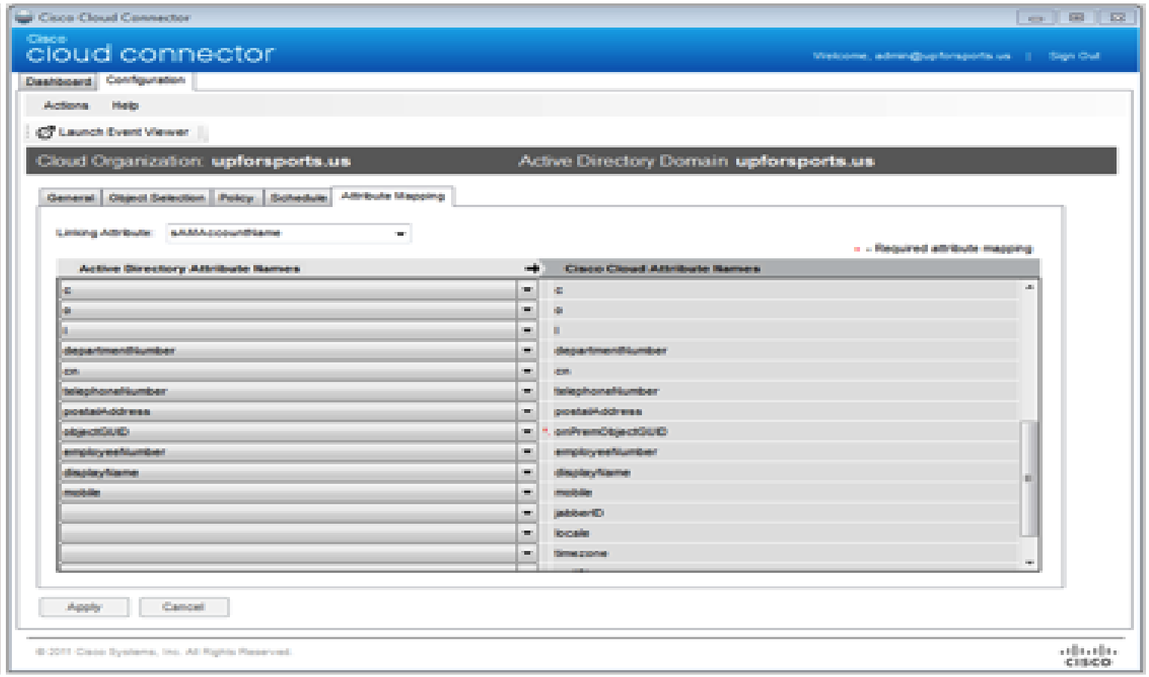


WebEx Cloud User Account Management Options

Option	Description
Manual updates through Org Admin	•Admin can use Org Admin to manually update user accounts
File import to Org Admin	•Admin can create and update accounts by importing a change file into Org Admin
Directory Integration (FTP approach and will be depreciated soon)	•Semi-automatic method for creating, updating and deactivating user accounts and groups. •Customer creates scripts to capture account changes in their Active Directory. The change files are uploaded to a WebEx FTP server and automatically imported into Connect user DB •Advanced Services engagement
Single Sign-On	•SSO can be configured to automatically create accounts when user logs-in to Connect for the first time •SAML assertion provides user information •Accounts can be created and updated but not deactivated
Cisco Cloud Connect	• Connect to AD for Windows Server 2003 & 2008 and quickly onboard new identities • Syncs all the changes that happens in AD

Cisco Cloud Connector 1.0





Easy Enterprise

Connect to AD for Windows Server 2003 & 2008 and quickly onboard new identities

Easy to Manage

Sync changes to ensure customers can get access

Easy Compliance

Stay in sync with changes to better manage password resets and de-provisioning

Cisco Cloud Connector Benefits

Enterprise

AD

Cloud Connector

Benefits

- Integrate quickly to Enterprise AD
- Compliance

Cisco Collaboration Cloud

Benefits

- Better security
- Easier integration
- Reduce Cost

WebEx Social

WebEx 11

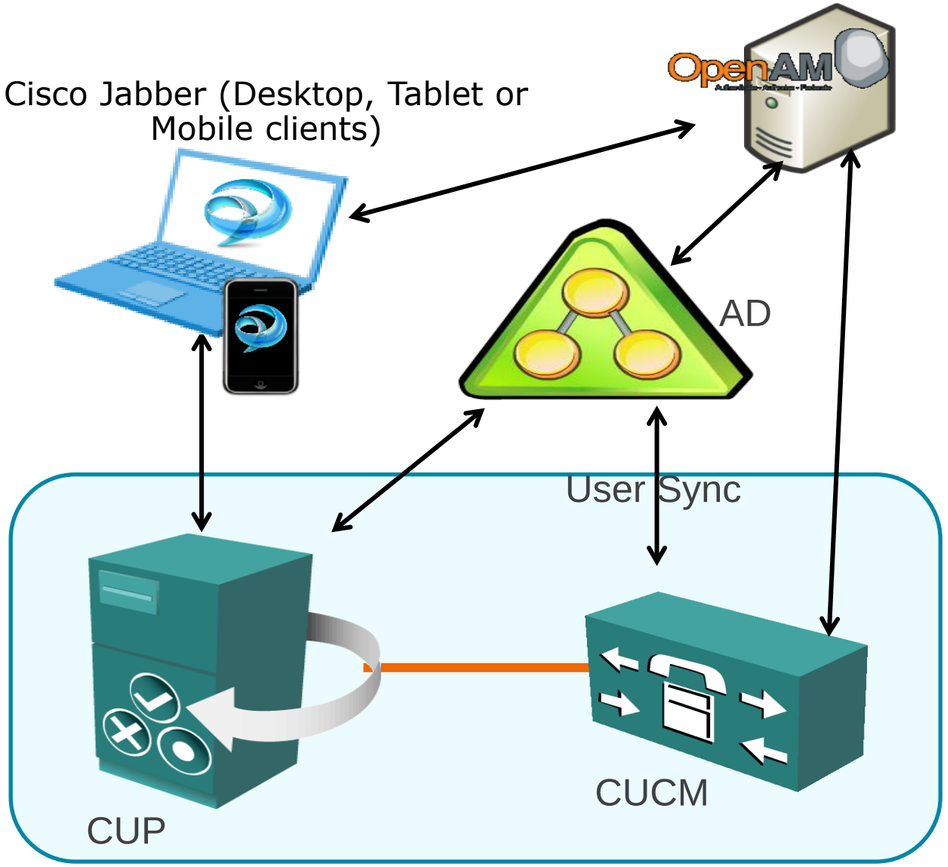
Jabber IM

Benefits

- Integrated UE
- Increase Collaboration
- Increase ARPU

Jabber Login

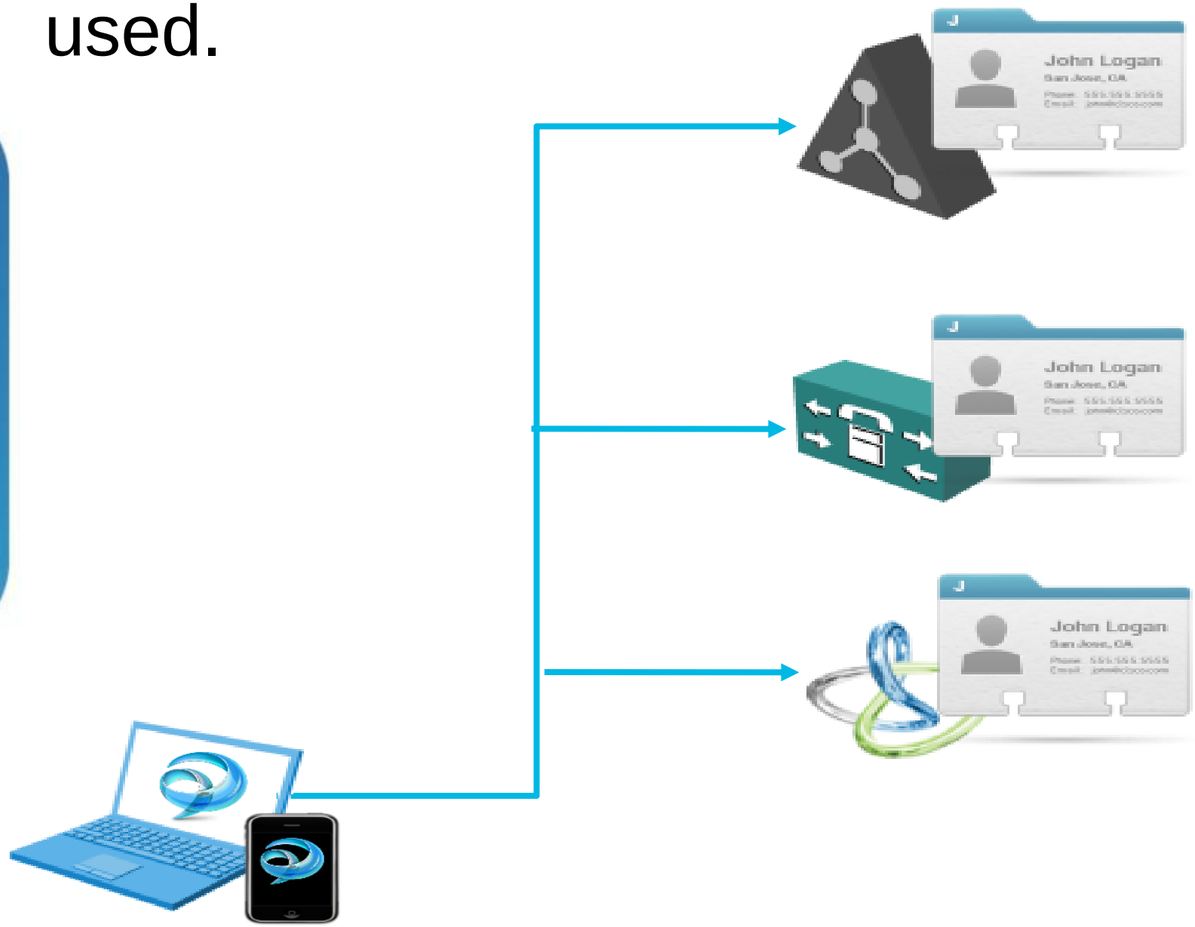
- DNS SRV lookup to locate CUP
- A SOAP login will be initiated with CUP
  - If AD authentication is enable in CUCM, CUP will contact the AD.
  - If CUCM local Authentication is used CUCM will be used
  - If SSO is enabled in CUCM the CUCM Policy agent will be used for Authentication
- Upon success, CUP returns various details such as primary/backup XMPP nodes, LDAP, WebEx profiles etc.



Cisco Jabber for Windows

Understanding Contact Record Sources

Based on client operating mode appropriate record sources will be used.



Auto detect Active Directory/LDAP (on prem)
Recommended pre 8.6(2)

UC Manager UDS Service (on prem)
Recommended for 8.6(2) +

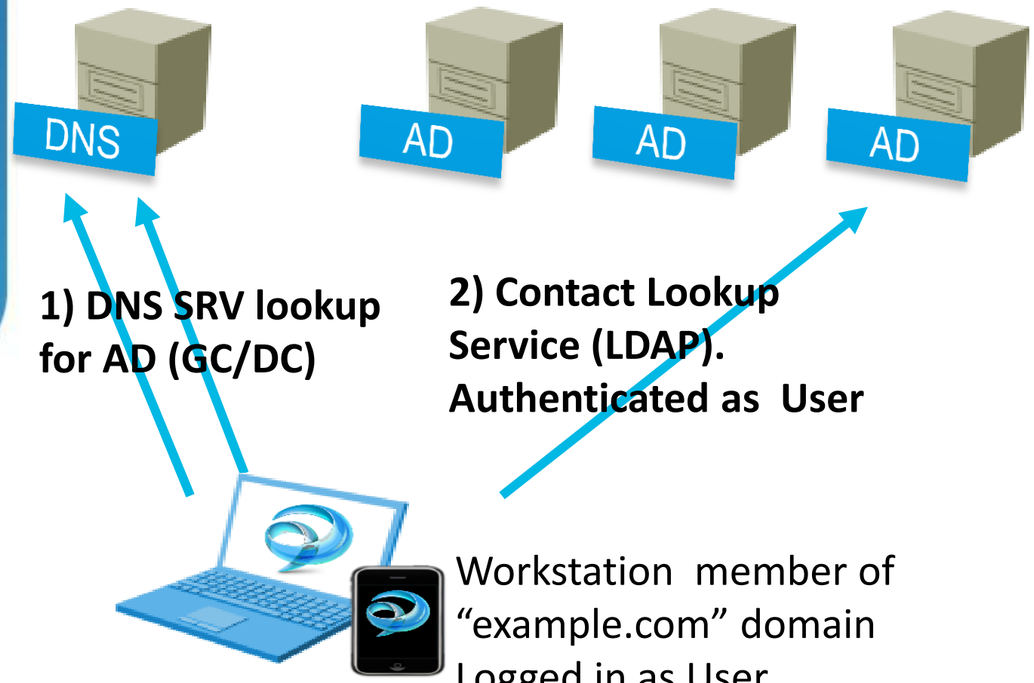
Webex Corporate Directory (Cloud)

Cisco Jabber for Windows (on premise)

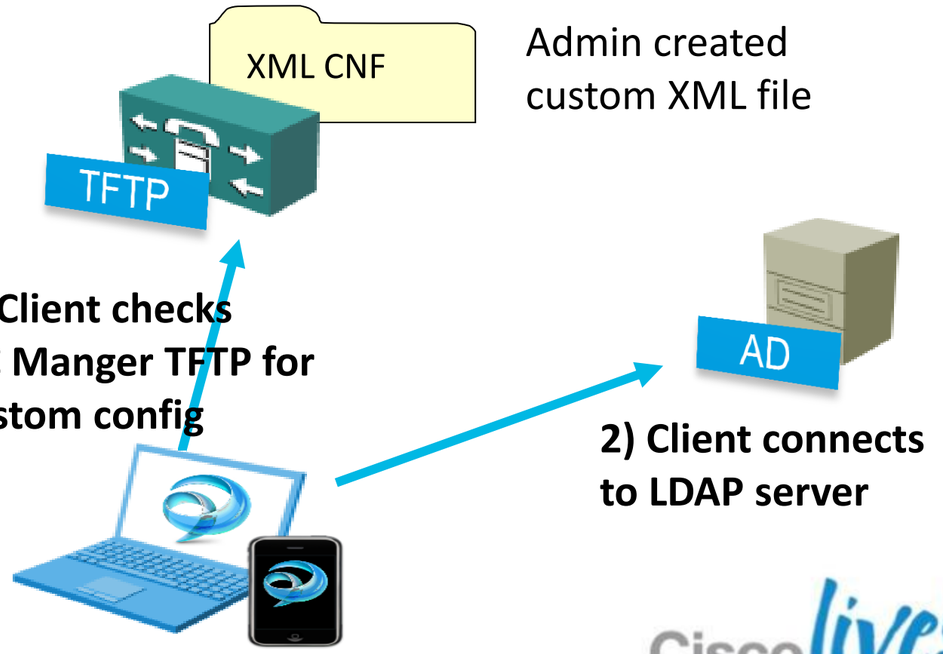
Active Directory Contact Record Source

- Active directory record source connects to AD/LDAP
- Used updated version of EDI integration from CUPC/CUCILYNC
- Ambiguous name resolution (ANR) is used for search which is more efficient and uses less server resources than pervious searching methods.

Auto-discovery configuration



Custom Configuration



EDI – Enhanced Directory Integration

Custom Directory Access Parameters

Connection Settings
Connection Type
UseSecureConnection
UseSSL
PrimayServerName
Port1
SecondaryServerName
Port2

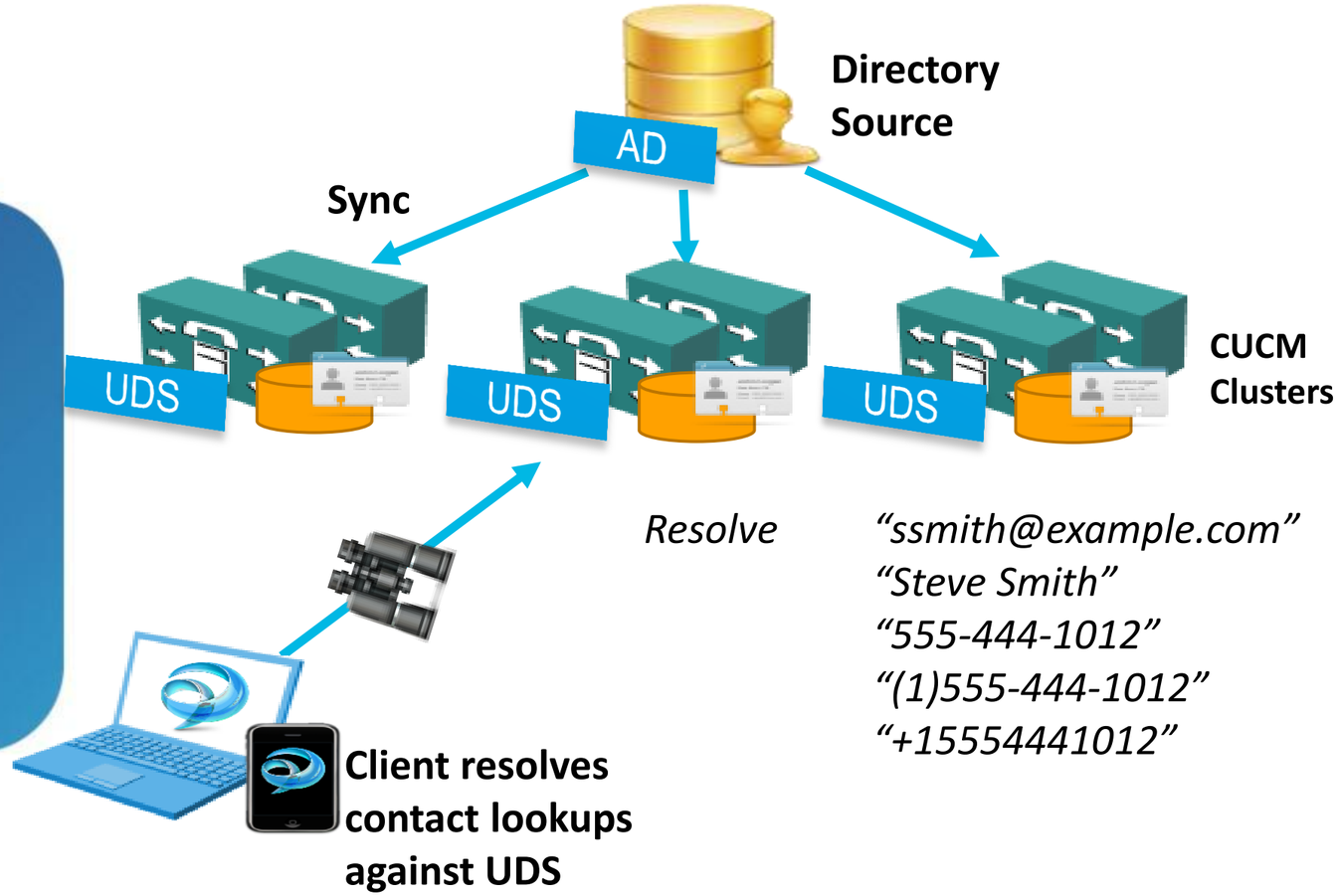
Search
SearchBase1
SearchBase2
SearchBase3
BaseFilter

Attribute Map	
CommonName	Nickname
FirstName	PostalCode
LastName	State
EmailAddress	StreetAddress
SipUri	PhotoURI
BusinessPhone	CompanyName
HomePhone	UserAccount
OtherPhone	Domain
PreferredNumber	Location
Title	

Authentication
UseWindowsCredentials
ConnectionUsername
ConnectionPassword

Cisco Jabber for Windows (on premise)

UDS Contact Record Source



- When using the UDS Contact Record Source the client performs contact resolution against communication manager.
- The communications manager User Data Service provides an optimised contact lookup service from CUCM 8.6(2)
- UDS provides a cross cluster contact service supporting up to 80,000 contacts.

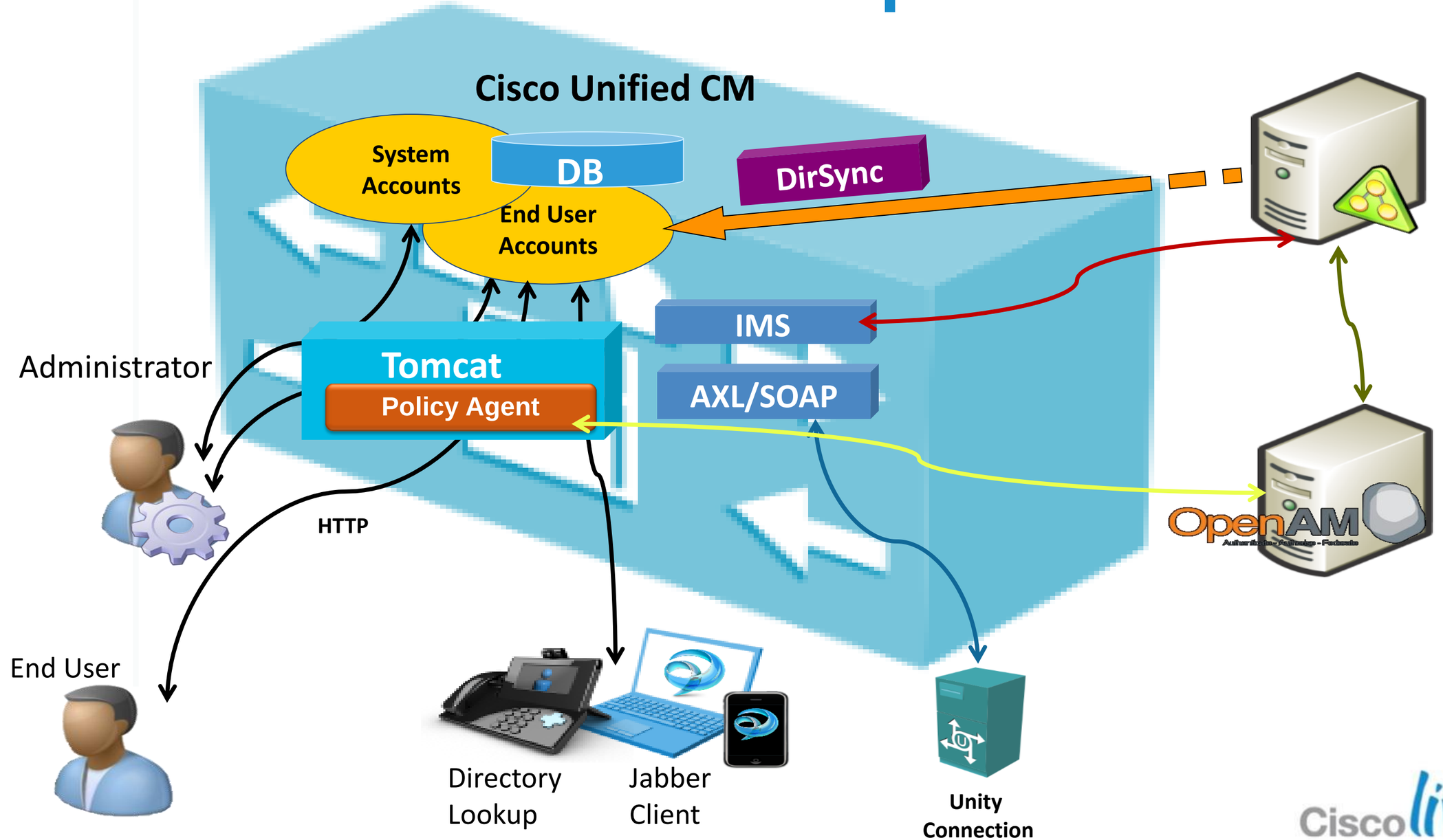
Single Sign-On with OpenAM

Authorisation & Authentication Services

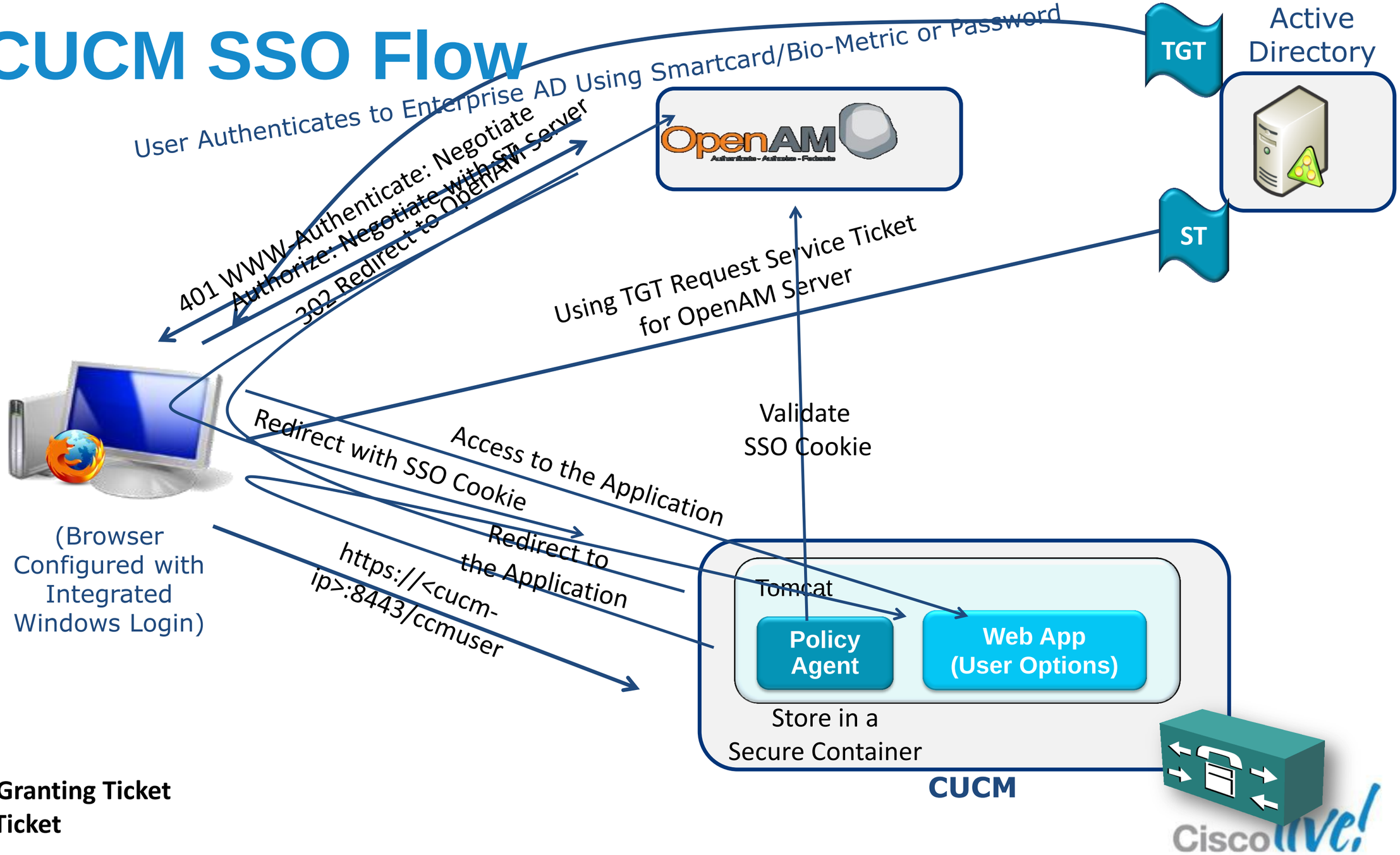
Solution Support by Cisco Collaboration Portfolio

- Integration of the Cisco Identity Management System (IMS) with the Open Web Single Sign-On architecture, which is an open source initiative started by Sun Microsystems
- After the acquisition of Sun Microsystems by Oracle, Oracle announced that OpenSSO would no longer be their strategic product. OpenSSO continues to be developed and supported by ForgeRock under the name of OpenAM.
- OpenAM provides open source Authentication, Authorisation, Entitlement and Federation software.
- OpenAM provides core identity services to simplify the implementation of transparent single sign-on (SSO) as a security component in a network infrastructure

CUCM Interaction with OpenAM



CUCM SSO Flow



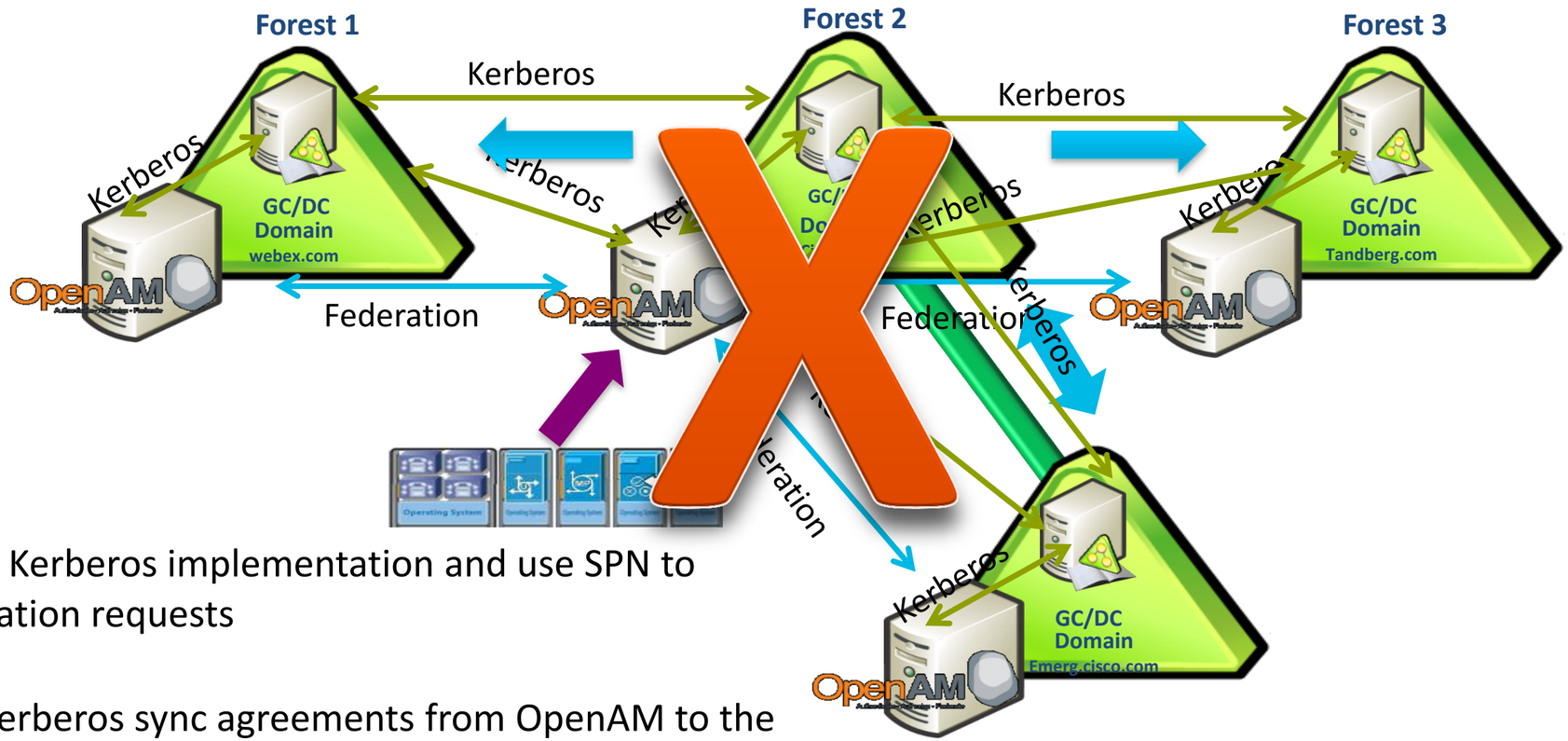
TGT: Ticket Granting Ticket

ST: Service Ticket

SSO with Multiple Domains

SSO with Multiple Domains

Kerberos Relay Solution could be hard to maintain



Rely on Microsoft Kerberos implementation and use SPN to "relay" authentication requests

Create multiple Kerberos sync agreements from OpenAM to the KDC of each domain

SSO with Multiple Domains

Rely on Microsoft Kerberos implementation and use SPN

Kerberos Service Principal Names (SPN)

- Unique identifier for a service running on a server
- Before Kerberos can use a SPN to authenticate a service, the SPN must be registered on an account object
- It uses the AD attribute ServicePrincipalName
- Registered with SETSPN.exe or ADSIEdit, and stored as AD property
- Pattern:**<service class>/<host>:<port> <service name>**

Examples on how to add an SPN:

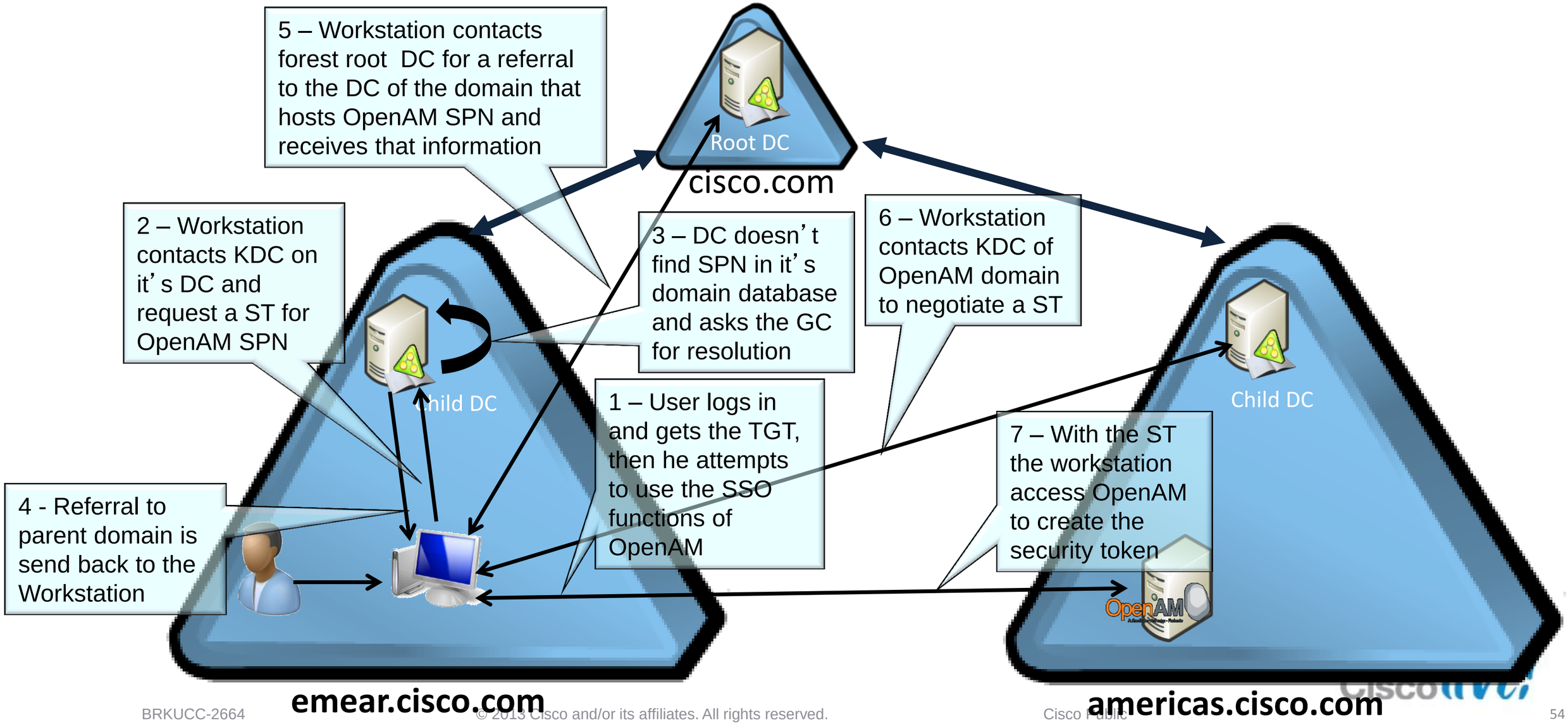
Setspn –A HTTP/sso.cisco.com:8443 CISCO\CiscoSSO

**** The SPN format is not a URL! ****

KTPass and its Role

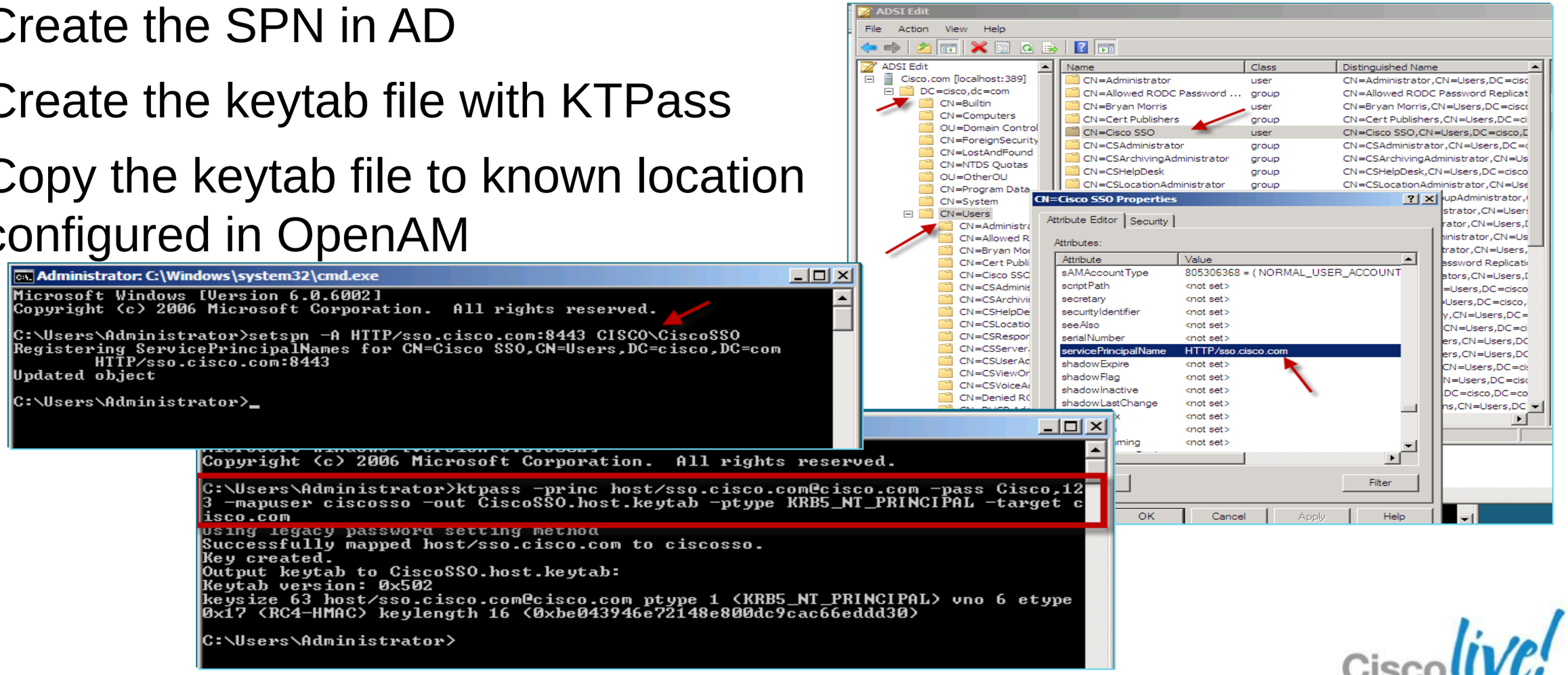
- Configures the server principal name for the host or service in Active Directory Domain Services (AD DS) and generates a .keytab file that contains the shared secret key of the service.
- The .keytab file is based on the Massachusetts Institute of Technology (MIT) implementation of the Kerberos authentication protocol.
- The Ktpass command-line tool allows non-Windows services that support Kerberos authentication to use the interoperability features provided by the Kerberos Key Distribution Center (KDC) service in Windows Server.

Kerberos Authentication Over Domain Trusts in a Single Forest

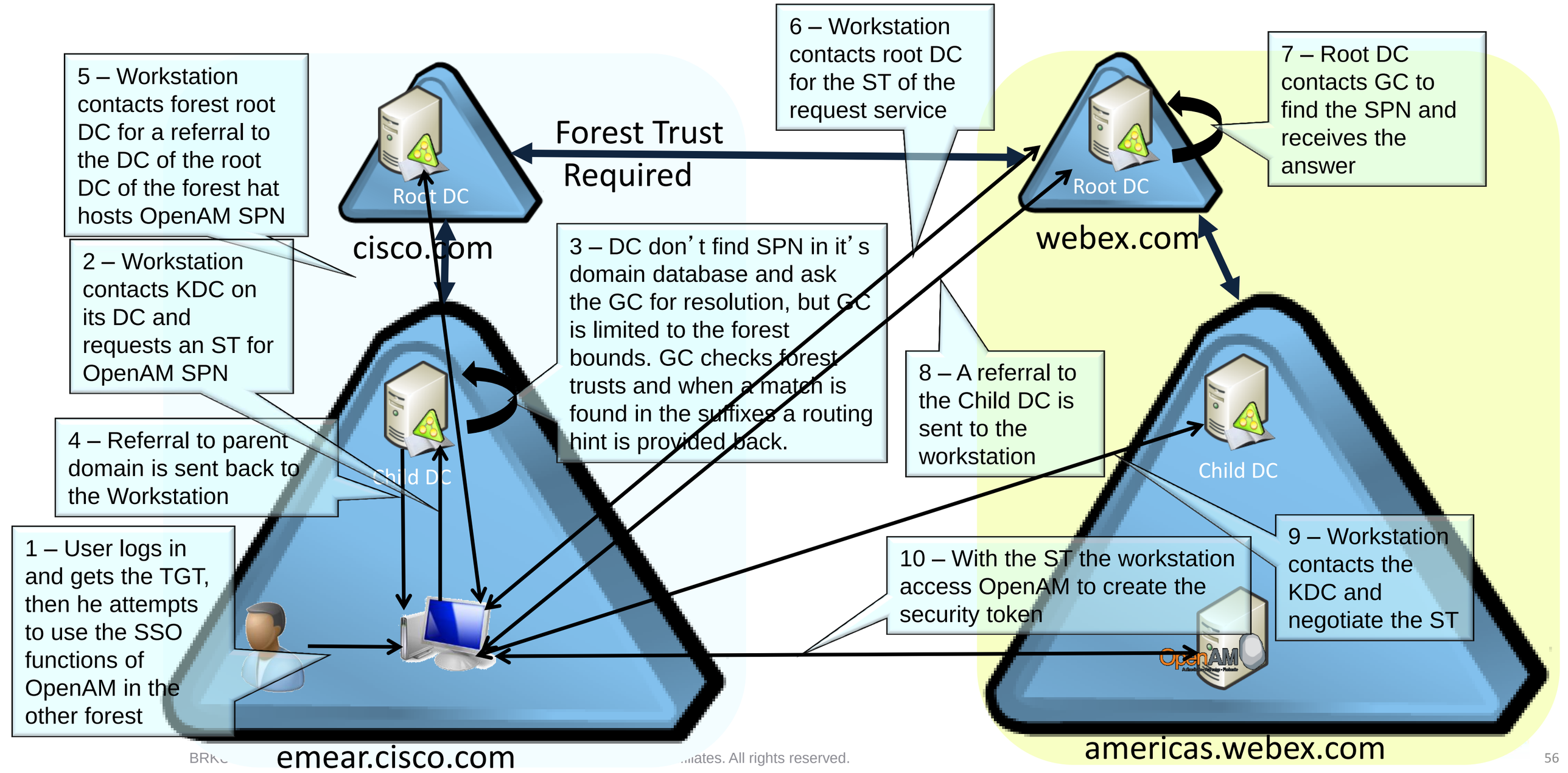


Prerequisites for SSO in a Single Forest

- Create a user domain account that will be used by OpenAM
- Create the SPN in AD
- Create the keytab file with KTPass
- Copy the keytab file to known location configured in OpenAM

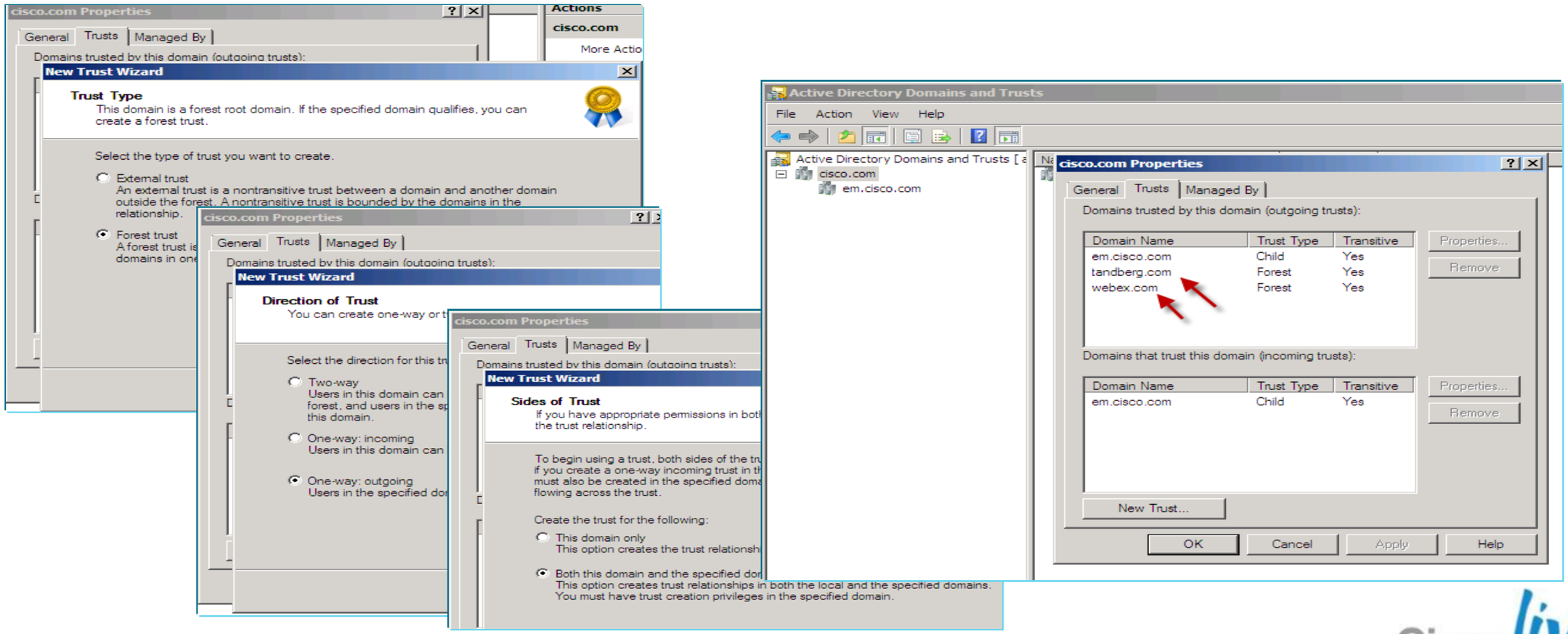


Kerberos Authentication Process Over Different Forests



Prerequisites for SSO with Multiple Forests

- Same process as described in the slides for single AD forest
- Outbound trust for the forest that we want to extend SSO to

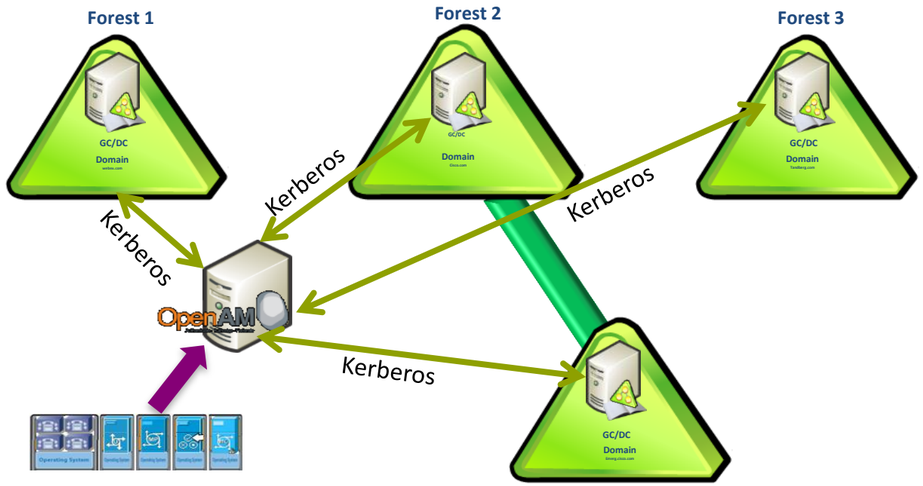


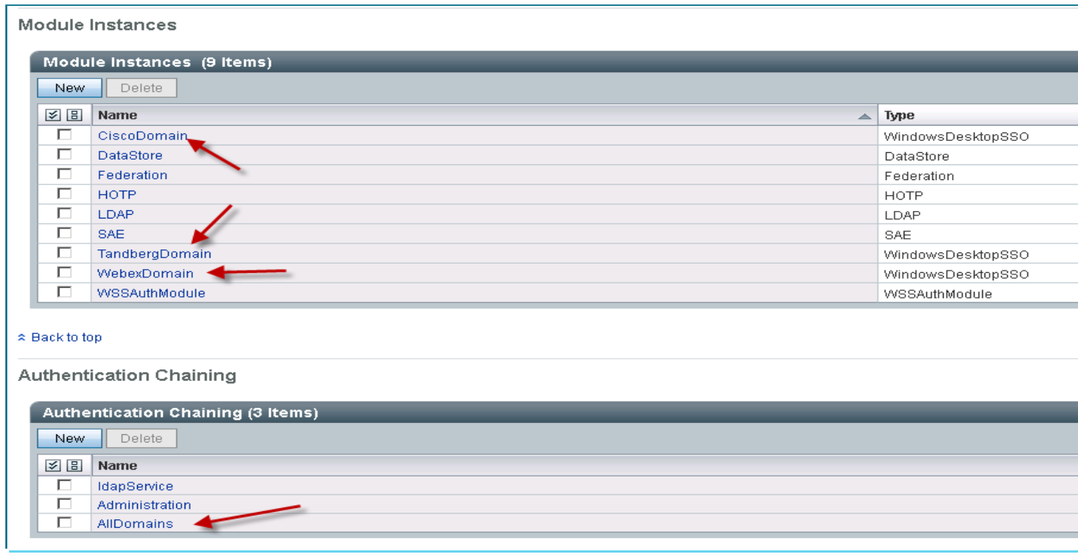
SSO with Multiple Domains

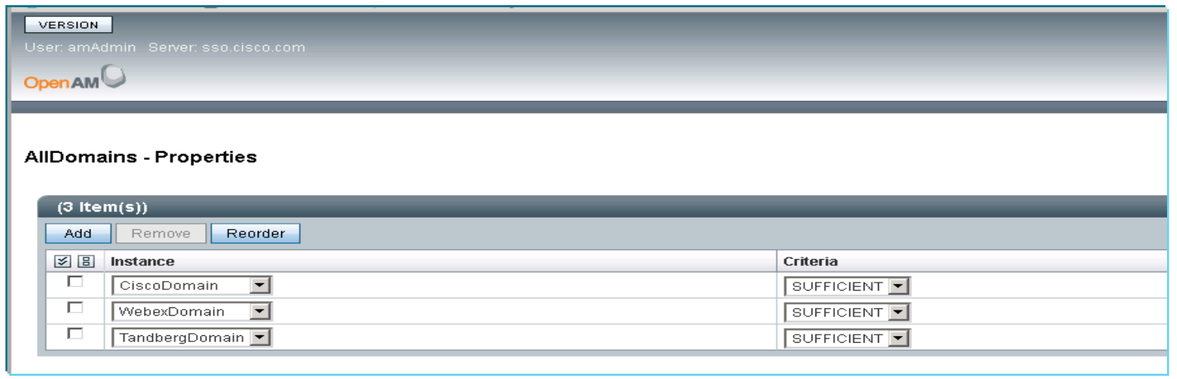
Multiple Kerberos Sync Agreements

Individual Kerberos Agreements with Each Domain

- Create a User domain account in each domain that will be used by OpenAM
- Create the keytab file with KTPass for each domain
- Copy the keytab files to a known location to be referenced by OpenAM



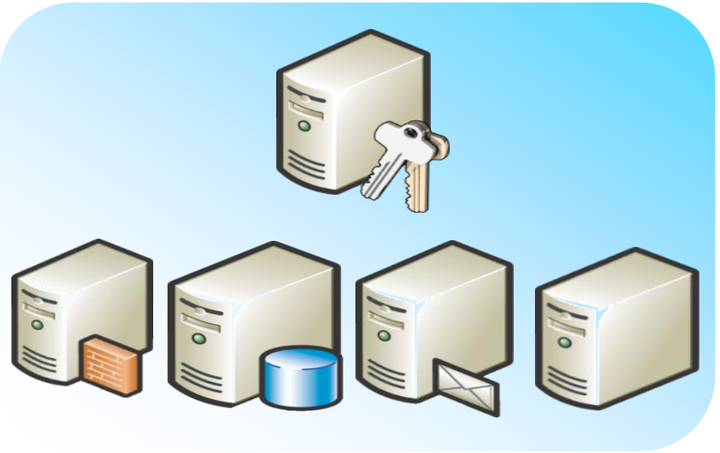




A Broader View on Authorisation and Authentication Services

What Other Scenarios Are There in A&A for Our Collaboration Portfolio

- There is already an identity management solution in the customer network, that delivers SSO and user directories.



- We have an organisation that also has cloud services in addition to the on-premise.

Identity and Access Management?

"In the information systems security space, **identity management** recently emerged as a new term that covers the following areas of computing:

– **Provisioning**. Adds new users to network operating system directories and application server directories, both inside an enterprise and outside at partner information systems.

– **Password management**. Enables users to have a single set of credentials to sign on to the company information systems. Additionally, it enables users to self-administer their passwords, user account data, and privileges.

– **Access control.** Enables the system to recognise security policies for groups of users. For example, a security policy would prevent people from changing their own job title and instead route a request for a job title change to the appropriate authority.

From IBM Developerworks

Note : Sometime we can see it also as IDMS (Identity Management System)

Example of IAM's

- **Identity and Access Management** (IAM) systems available in the market:
  - CA SiteMinder and Identity Manager
  - FragleRock OpenIDM
  - IBM Tivoli Identity Manager
  - Novell Identity Manager
  - Oracle Identity manager
  - Microsoft Forefront Identity Manager

Why Do We Need SAML 2.0?

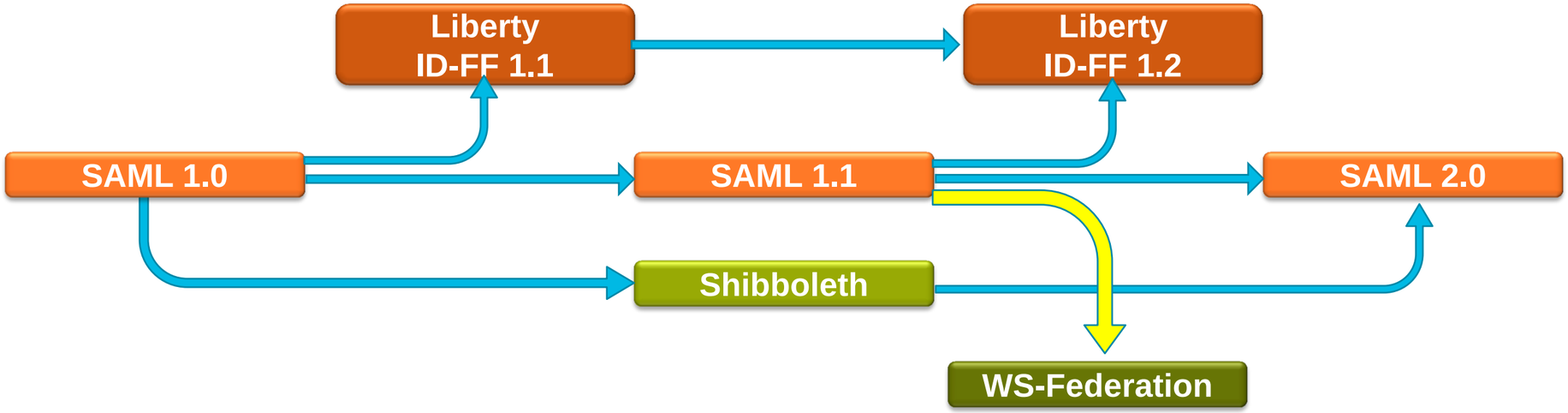
- Single Sign-On across domains
- Cookies prevent the need for reauthorisation
- SSO interoperability (before SAML little)
- Web Service Security (SAML allows for the exchange of assertions within a SOAP document)
- Federated Identity (consolidate identities across organisational boundaries)

SAML (Security Access Markup Language) 2.0

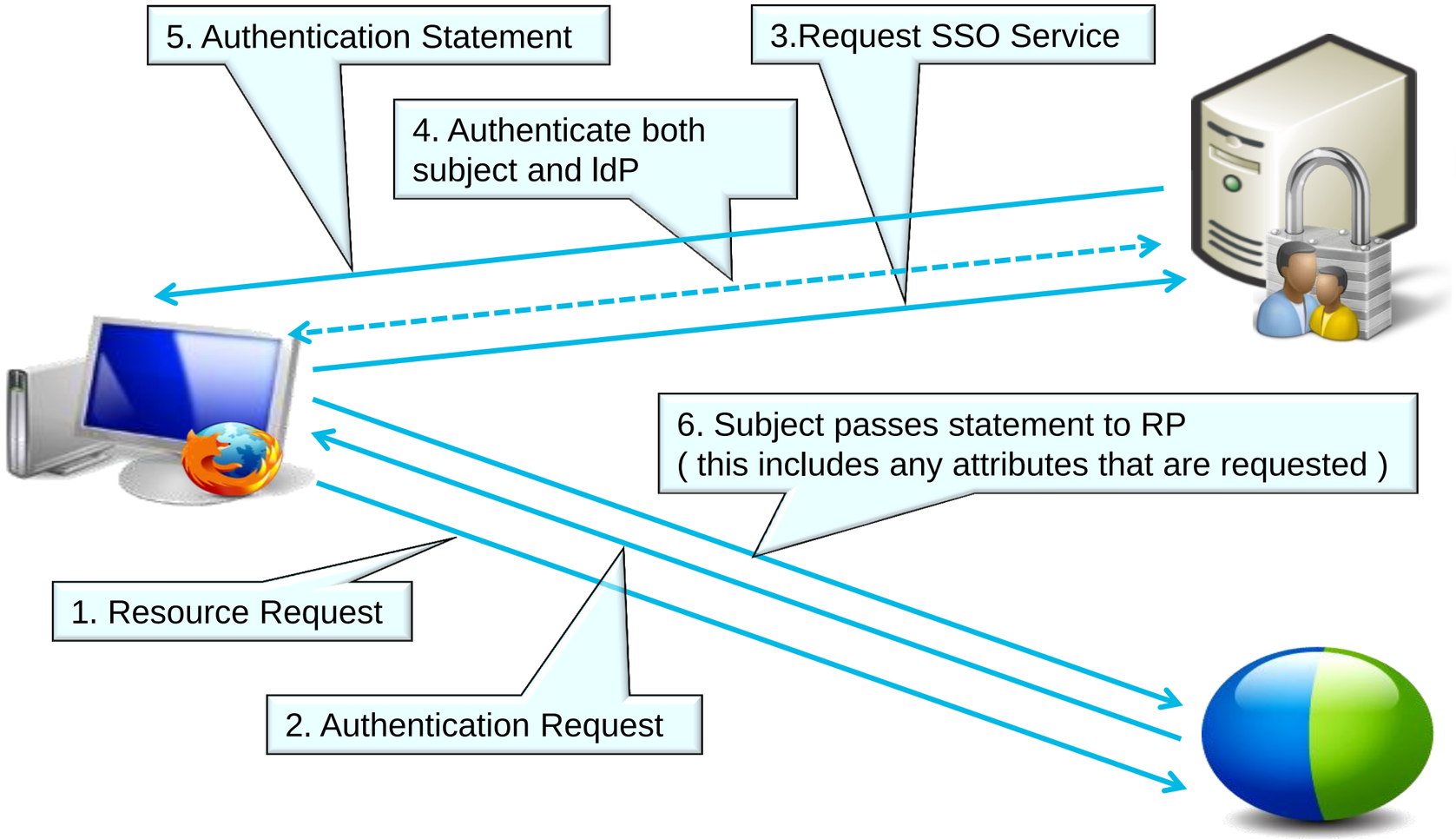
The SAML standard is managed by the OASIS Security Services Technical Committee

http://www.oasis-open.org/committees/security

SAML is a protocol specification to use when two servers need to share authentication information. Nothing in the SAML specification provides the actual authentication service…



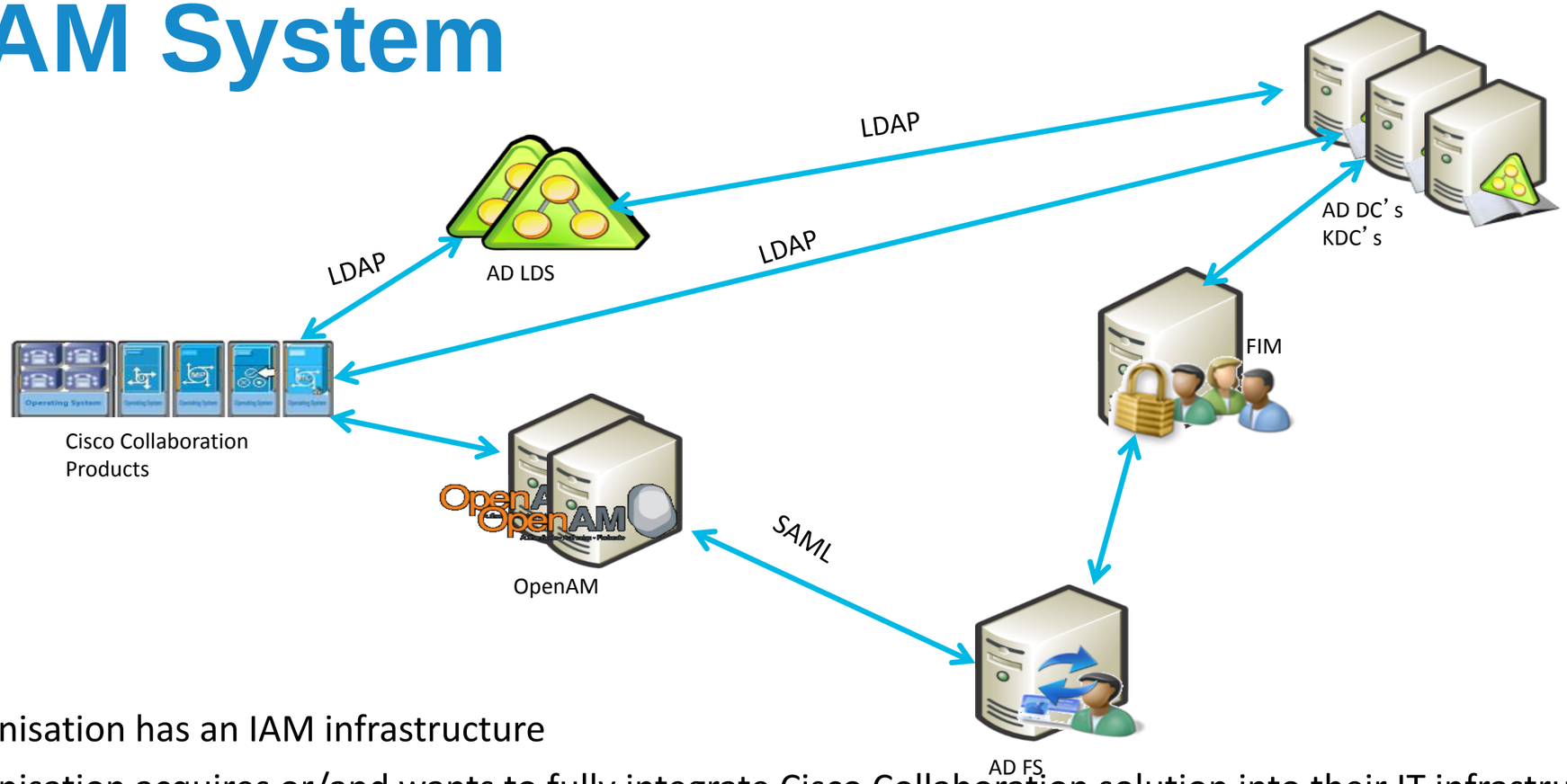
SAML 2.0 Flow



Federations Mechanisms Supported by OpenAM

- OpenAM supports several open federation technologies including the Security Access Markup Language (**SAML**) versions 1 and 2, **WS-Federation**, and the Liberty Alliance Project Identity Federation Framework (**Liberty ID-FF**).
- **SAML** Standard for passing credentials between different Internet domains that have their own authentication systems.

When the Organisation Already has an IAM System



Organisation has an IAM infrastructure

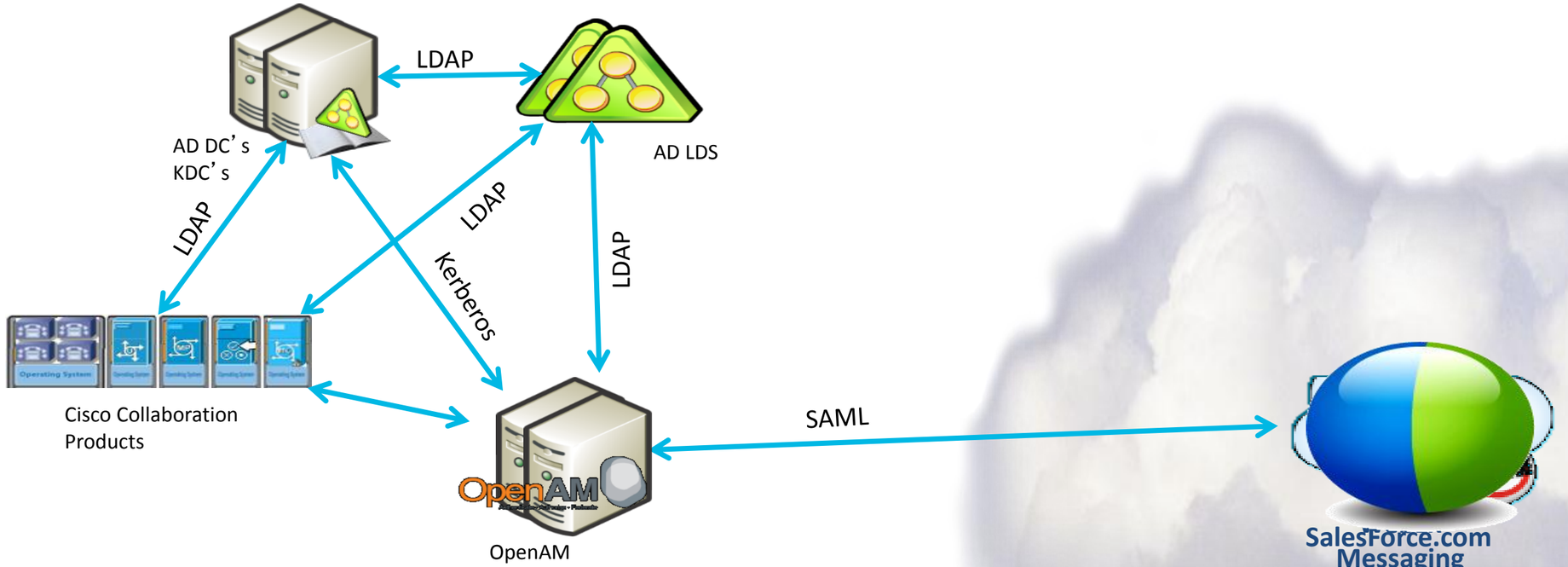
Organisation acquires or/and wants to fully integrate Cisco Collaboration solution into their IT infrastructure

First step is to have a common user database

In some organisations it isn't possible to get the information directly from AD DC so we need to use an LDAP frontend

For Single Sign-On, OpenAM can federate with the IAM system

When the Customer Needs to Extend SSO to a Cloud Service



Organisation enables SSO for Cisco on-Premise Collaboration Products

In some organisations it isn't possible to get the information directly from AD DC so we need to use an LDAP frontend

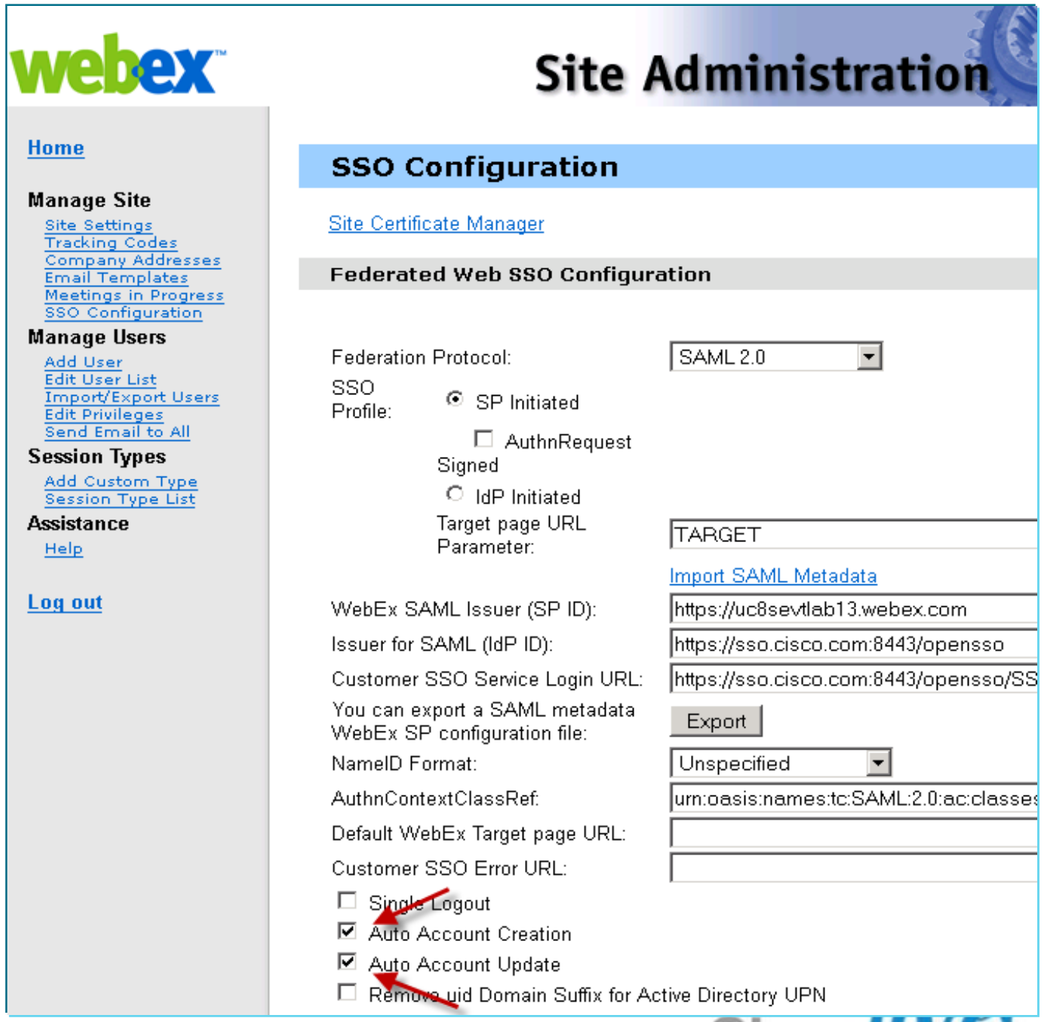
OpenAM needs to have it own user database gathered from the LDAP frontend

OpenAM federates with cloud services like Salesforce.com using SAML

Apart from the authentication, SAML can also populate cloud services like Webex with user information, so there isn't a need to add users twice (on-premise and cloud)

Populating WebEx with User Information

- Auto Account Create (only needed if automatic user creation is required)
  - Requires “firstname”, “lastname”, “uid”, and “email”
  - Users are assigned the default session type / policy action
- Auto Account Update (only needed if automatic user information update)
  - Requires “updateTimeStamp”
  - Users accounts will be updated when the “updateTimeStamp”
  - value is incremented
  - Only values passed in the assertion will be updated



Limitations of SAML Integration with WebEx

- Users cannot sign in if they have been deactivated by the Identity Provider (IdP) or “Federation Server”, therefore accounts cannot be deactivated with SSO
- When accounts have been deactivated by the IdP, then the accounts will no longer be granted access, but these accounts will be still be “active” in “Centres” and WebEx Connect until they have been deactivated by a Site Admin

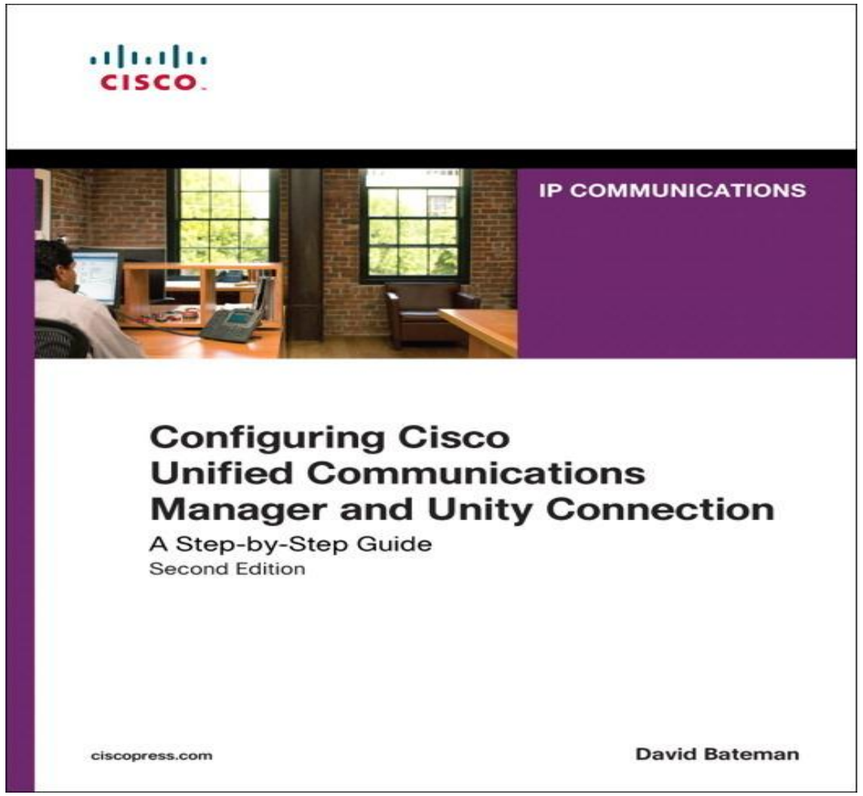
Key Takeaways and Q&A

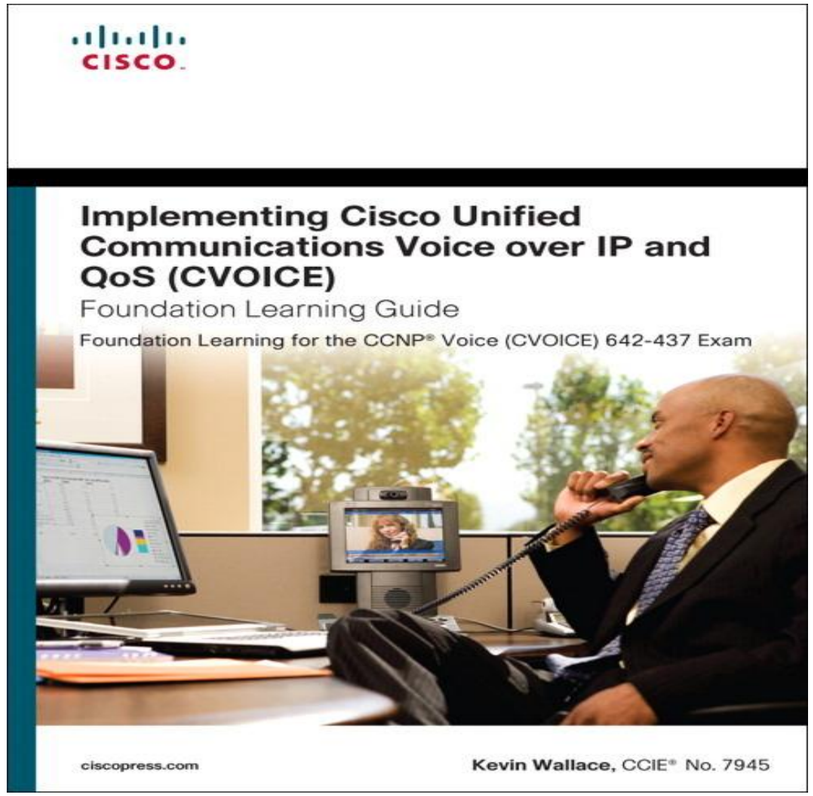
Key Takeaways

- Directory and A&A services should be carefully considered when planning a collaboration project
- Cisco is building an open, Web 2.0 based interface that will allow consolidation of user directory information into a single location.
- There are multiple options to support SSO when the organisations have multiple AD domains, tree, forest. A decision must be taken based on the needs and security policy of the organisation.
- If there is already an Identity and Access Management system inside the organisation the collaboration solution should integrate with it.
- Every organisation is considering cloud to complement or replace the on-premise services and that should not be a show stopper for an integrated directory and Single Sign-On Strategy

Recommended Reading

BRKUCC-2664





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