PANEL - ICDT, SPACOMM

Converging Telecommunications: Paved Ways or Plenty of Bumps?

INTRODUCTION

Eugen Borcoci,
University "Politehnica" of Bucharest

ICDT, SPACOMM 2011 Conferences, Budapest April 18-22 2011

PANEL – ICDT, SPACOMM

Converging Telecommunications: Paved Ways or Plenty of Bumps?

Panelists:

Timothy Pham, Jet Propulsion Laboratory, USA
Bilal Al Momani, Cisco Systems, Inc. Ireland
*Eugen Borcoci, University "Politehnica" of Bucharest, Romania*

Converging Telecommunications: Paved Ways or Plenty of Bumps?

- **FACTS**
- **Telecommunication and Internet convergence- recognized and developed – last 15 years**
  - **Telecom evolution:**
    - **PSTN, ISDN, BISDN,**
    - **2G, 3G, NGN (IMS), …**
      - Powerful control from the operators
      - User may only select among services offered
  - **Internet:**
    - Traditional TCP/IP stack, Edge intelligence concept
    - Many protocol added during the years
    - Web development- significant step forward
    - A lot of serious limitations (given the global deployment of today)
    - Now: Future Internet? **Evolution/revolution?-** large discussions today
  - **Future (Convergent) Networks (still a goal)**
    - Full service integration- based on packet networks support and layered architectural stack
    - Intelligent terminals, flexible IP –based transport
  - **Significant progress done in the last decade towards convergence, however many open issus (architectural, technical, economical, regulation, social, etc.)**

ICDT, SPACOMM – IARIA Conferences, April 18-22 2011, Budapest

Panel topics

- **Short presentations:**

  - *Timothy Pham: Observations related to Deep Space Communications*

  - *Bilal Al Momani: CISCO Unified Communication Presence*

  - *Eugen Borcoci: Telecommunication and Future Internet Convergence*

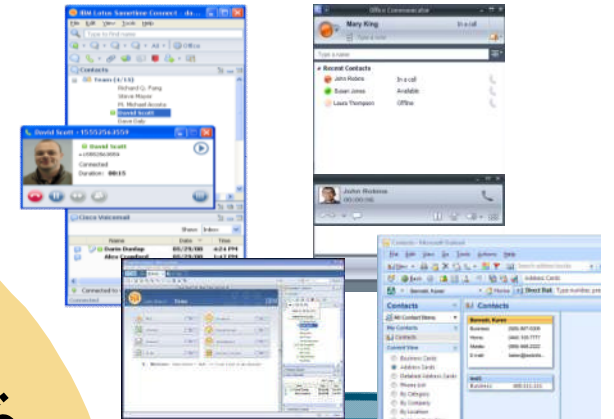- **Opinions expressed by the audience**

- **Q/As**
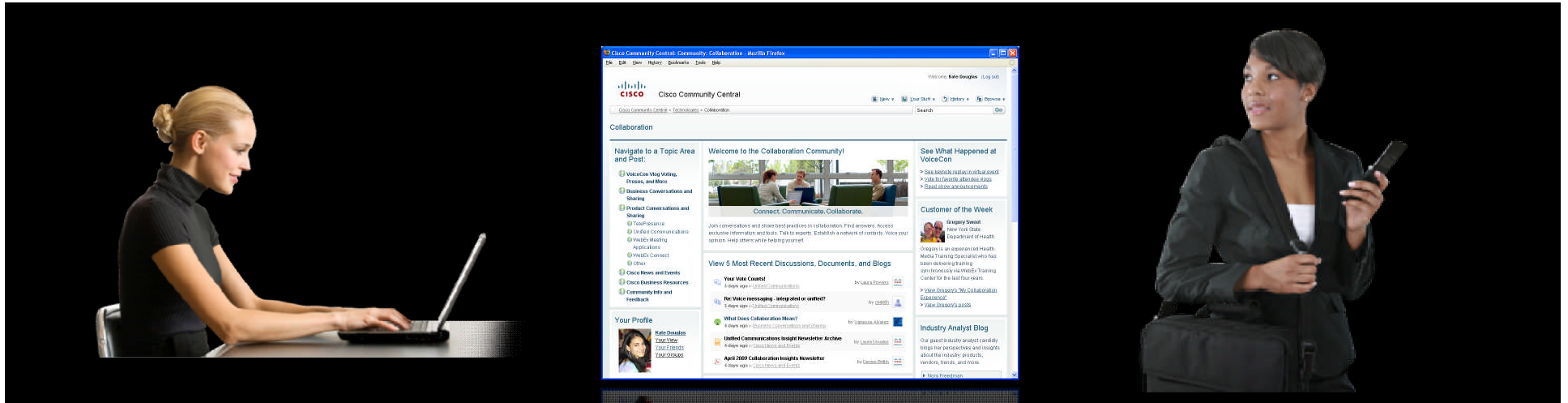
Cisco Unified Communication Presence

Bilal Al Momani, Cisco System, Ireland
balmoman@cisco.com

Cisco Desktop Collaboration solutions
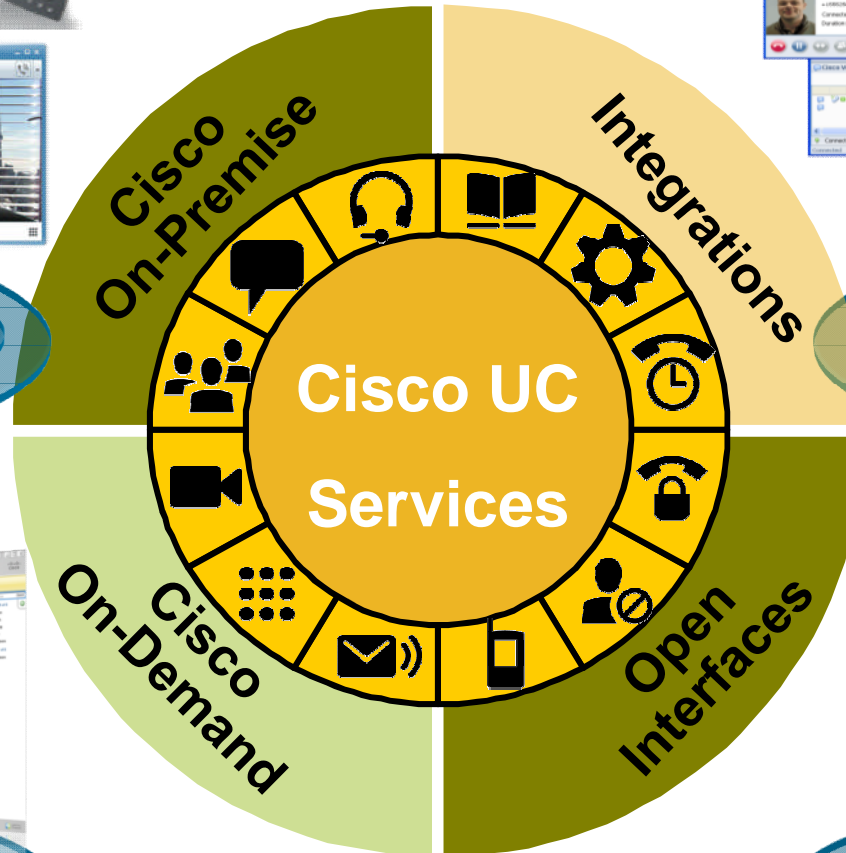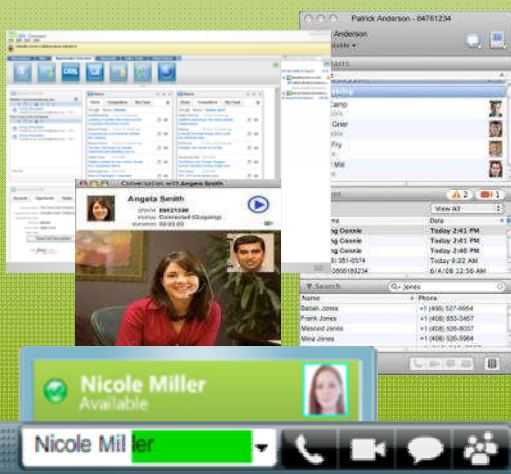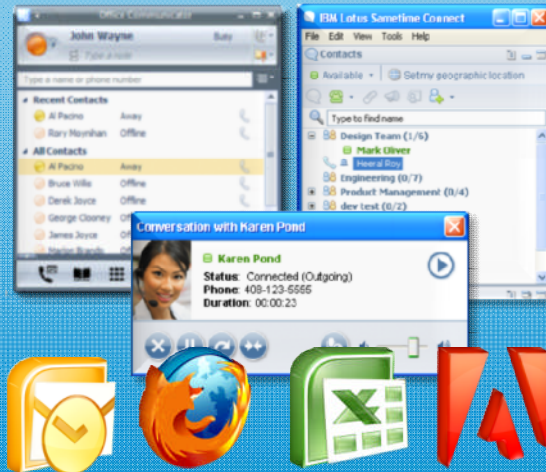

Cisco Unified Communications

Cisco WebEx

Cisco On-Premise

Integrations

Cisco On-Demand

Open Interfaces

Cisco UC Services

Cisco UC Interoperability

Cisco UC API's

Collaboration Architecture for Clients

Cisco Unified Presence Strategy

- Provide a common, easy and open way to share Presence and Instant Messaging, that works seamlessly in a Unified Desktop Workspace regardless of a customer's application and device choices

- Cisco Unified Presence

  - Seamless interoperability with IP Phones, Mobility, Contact Centers, and all variants of soft clients

  - Dual Protocol Standards based Interoperability (SIP, SIP/SIMPLE, XMPP) federations to Microsoft, IBM and all GoogleTalk applications

  - Web 2.0 centric Open Solutions and APIs

Cisco Unified Presence "Powered by Jabber"

Cisco Unified Presence

Interfaces

SIP/SIMPLE
REST
SOAP
API's

UC Manager

Unified Personal Communicator

3rd party XMPP clients

SIP & call control

Cisco Unified Client Services Framework

Interfaces

Jabber APIs
Jabber Werx
XMPP

Cisco Unified Mobile Communicator

Cisco Unified Mobile Advantage

SIP UC integrations

XMPP integrations

CUP

VOS

Rich, native Federation to Webex

webex

Expert Advisor

Agent Desktop

Contact Center

MS Exchange Calendaring

CUPC 7.1 (incl. MAC support)

IM & Presence Federations
Webex, OCS, IBM, Jabber XCP, GoogleTalk

jabber inc.®

IBM

Microsoft

Note: Other existing CUP functions continue to be supported:
- MS Client mode (OCS RCC)
- SIP Proxy
- IBM Telephony Presence integration

Cisco Unified Presence Features:

- High Availability (via Server Recovery Manager)

- Clustering over WAN

- Microsoft Exchange Calendaring via Exchange Web Services (EWS)

- Inter-domain Federation via SIP/SIMPLE

- Privacy Enhancements

- Serviceability Enhancements

- Additional UCS server support (B & C series)

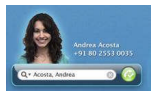# Cisco Unified Presence, Solution Overview

■ Enterprise-grade IM
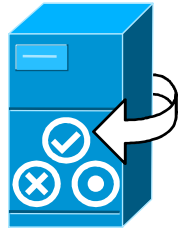
Secure, rich text IM

Group Chat

User History

Policy & Compliance

Multi-device IM

Media Escalation

Persistent Chat rooms

Open APIs

■ Policy and Compliance

Admin Presence Policy

IM Retention

Off-board Database support (Optional)

3rd party compliance engine (FaceTime)

■ Rich Network Presence

Always-on Telephony Presence

Always-on Calendaring Presence

Network-based Presence Aggregation from multiple sources and clients

3rd party Presence apps – sources and consumers

Network enforced Presence Policy

■ Federation

Enterprise federations (B2B)

Cisco Unified Presence (CUP)

Cisco Webex

Microsoft OCS

IBM Lotus SameTime

Jabber XCP

Public federations (B2C)

Google Talk
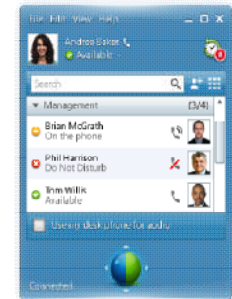
■ Unified Directory

Corporate Directory

Personal Directory and Buddy List

■ Scalability and TCO

Standard Cisco appliance model (MCS) with on-board DB for improved TCO

Multiple node scalability

■ Multiple Client support

CUPC 7.1 (incl. MAC) and Jabber MomentIM

CUPC 8.x – Next-gen Cisco Desktop UC client

Mobile clients / CUMC

Contact Center Agent Desktop and Expert Advisor

3rd party XMPP client & application support

Always On Presence – What Does it Mean ?

Larry is on the phone
and logged into his desktop client

Trisha is on the phone
and logged into her desktop client

Status = on the phone

Status = on the phone

Larry stays on the phone
and **logs out of his desktop client**

Trisha stays on the phone
and **logs out of her desktop client**

Both Larry and
Trisha are still
on the phone

Status = Unavailable

Status = on the phone

Cisco Unified Presence "Always on Presence" delivering a consistent presence experience

Cisco Presence and Clients Federation in UC 8.x

e.g. – AnotherCo.com

CISCO CUP
Microsoft OCS/LCS
IBM SameTime
jabber Jabber XCP

Desktop UC

B2B

Inter-Domain

Federation

B2B & B2C

cisco webex

Google
AOL

Mobile Client

CUP 8.x
e.g. – MyCo.com

Phone
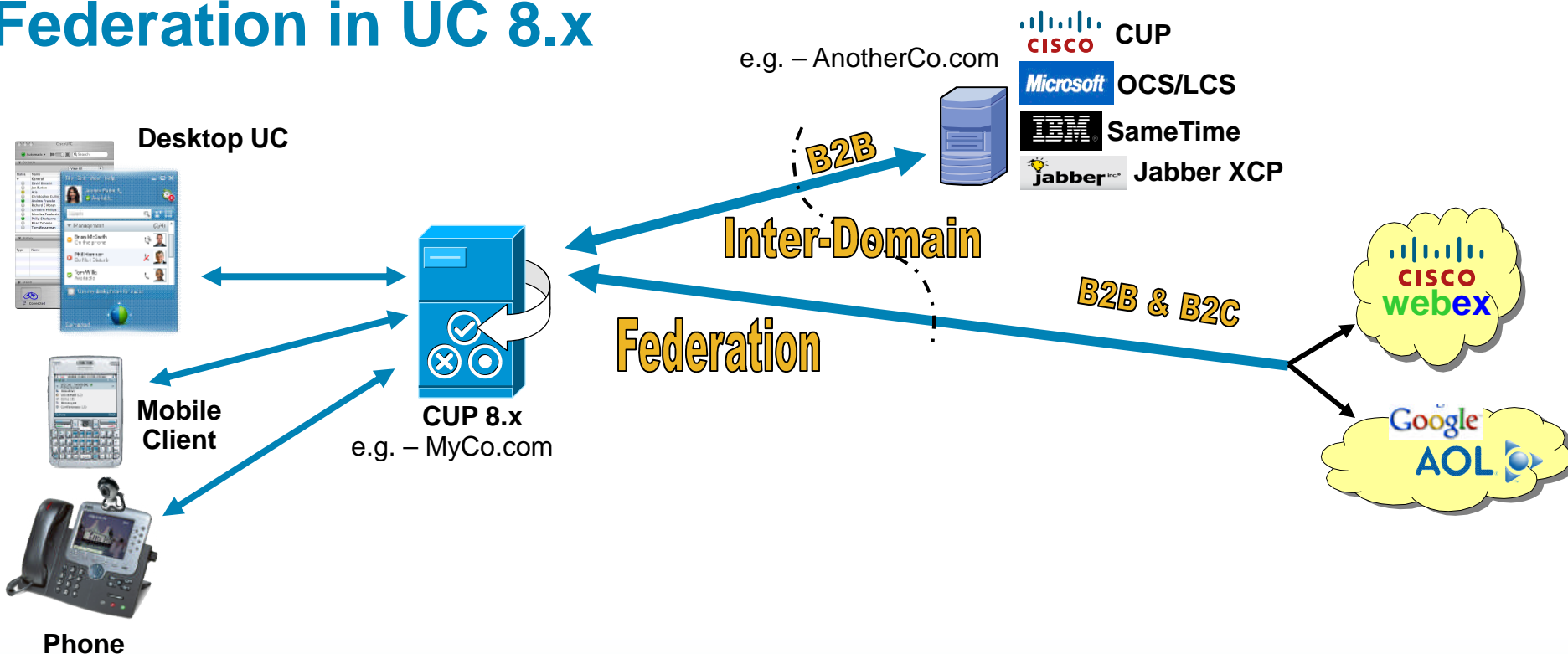
- **Standards-based SIP/SIMPLE Federation in place with CUP 7.0**
  - Presence & IM Federation to MS OCS/LCS Inter-Domain (B2B)

- **Jabber technology adds XMPP and additional Federations**

- **Presence & IM Inter-domain Federations for UC 8.x release**
  - CUP, Webex, Microsoft OCS, IBM Lotus SameTime and Jabber XCP (B2B)
  - XMPP federation to Google Talk (B2C)
  - AOL added in CUP 8.5

Cisco Unified Personal Communicator

Cisco Unified Communications Manager

Cisco Unified Presence

Cisco Adaptive Security Appliance

Federation

Public Network

Presence & IM

user@alpha.com

user@gamma.com
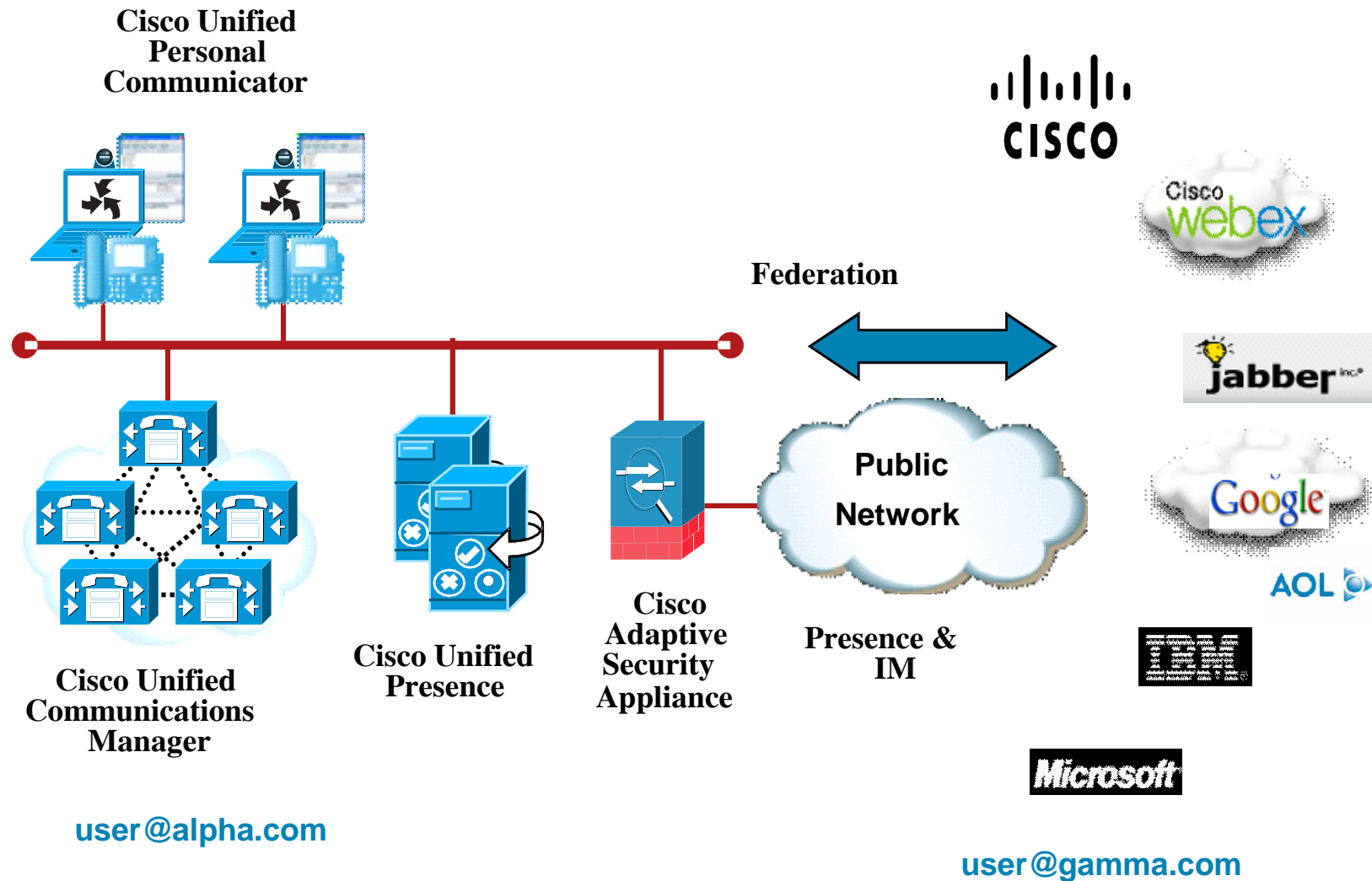
Cisco Unified Presence Benefits

Unified Personal Communicator

Unified Mobile Communicator

Contact Center integration

Expert Advisor

Agent Desktop

3rd party XMPP clients

Business App & Process integration

APIs & SDKs

B2B and B2C Federations

Cisco Unified Presence 8.x

Always-on network presence

CUCM 7.x/8.x integration

MS Exchange Calendaring

- Increase **Productivity** for Desktop and Mobile users

- **Choice** of Cisco clients and 3rd party Open Clients

- Enable Secure Business-to-Business **Collaboration**

- **Market-leading** and proven Enterprise IM via Jabber

- **Speed up** your Business Processes through Unified Communication integration

- Improve **Customer Satisfaction**
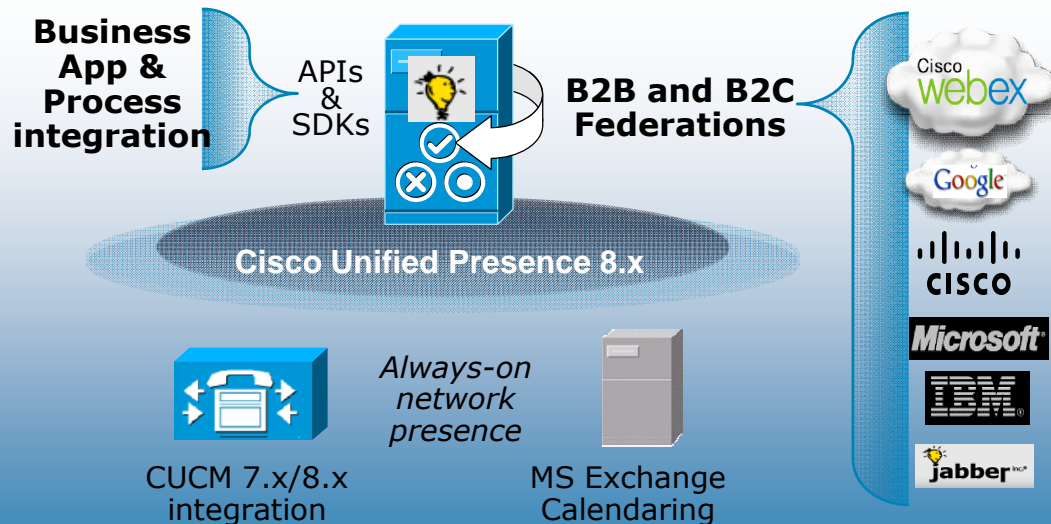
Thank you,
Q & A

Backup Slides

HA Overview

- HA is enabled per sub-cluster. The two nodes in a sub-cluster make up a HA pair.

- Each node will heartbeat its peer and monitor a list of critical services.

- If a node loses communication with its peer for a period of time (default is 60 seconds) it initiates failover

- If a node detects a critical service has not been running for a period of time (default is 90 seconds), then it tells its peer to initiate the failover

HA Overview - continued

- No automatic fallback. Admin must initiate fallback from the Admin GUI or CLI.

- Important to note that failover is not done immediately upon detection of an issue (critical service down, loss of peer heartbeat, etc.). There is a timeout so that we don't unnecessarily failover

- Supports manual failover as well. Admin can initiate via the Admin GUI or CLI

HA Overview - continued

- Failover consists of moving all of the users from the failed node to the backup node. Fallback consists of moving the users back to their primary node.

- It is essentially the same as the existing user move supported in CUP except that the users are marked as "failed over"

- New service "Cisco UP Server Recovery Manager" manages failover and fallback

Cisco Unified Presence 8.5 Cluster
High Availability

Cisco Unified Presence 8.5 Cluster

Cisco Unified Communications Manager Publisher

Database Sync

| 1A | 2A | 3A |
| 1B | 2B | 4A |

Sub-cluster 3

Sub-cluster 1   **Sub-cluster 2**   **Sub-cluster 4**

IDS Global User Data Replication

Volatile Persistent Data (Login state)

Times Ten Soft State Data (Presence info)
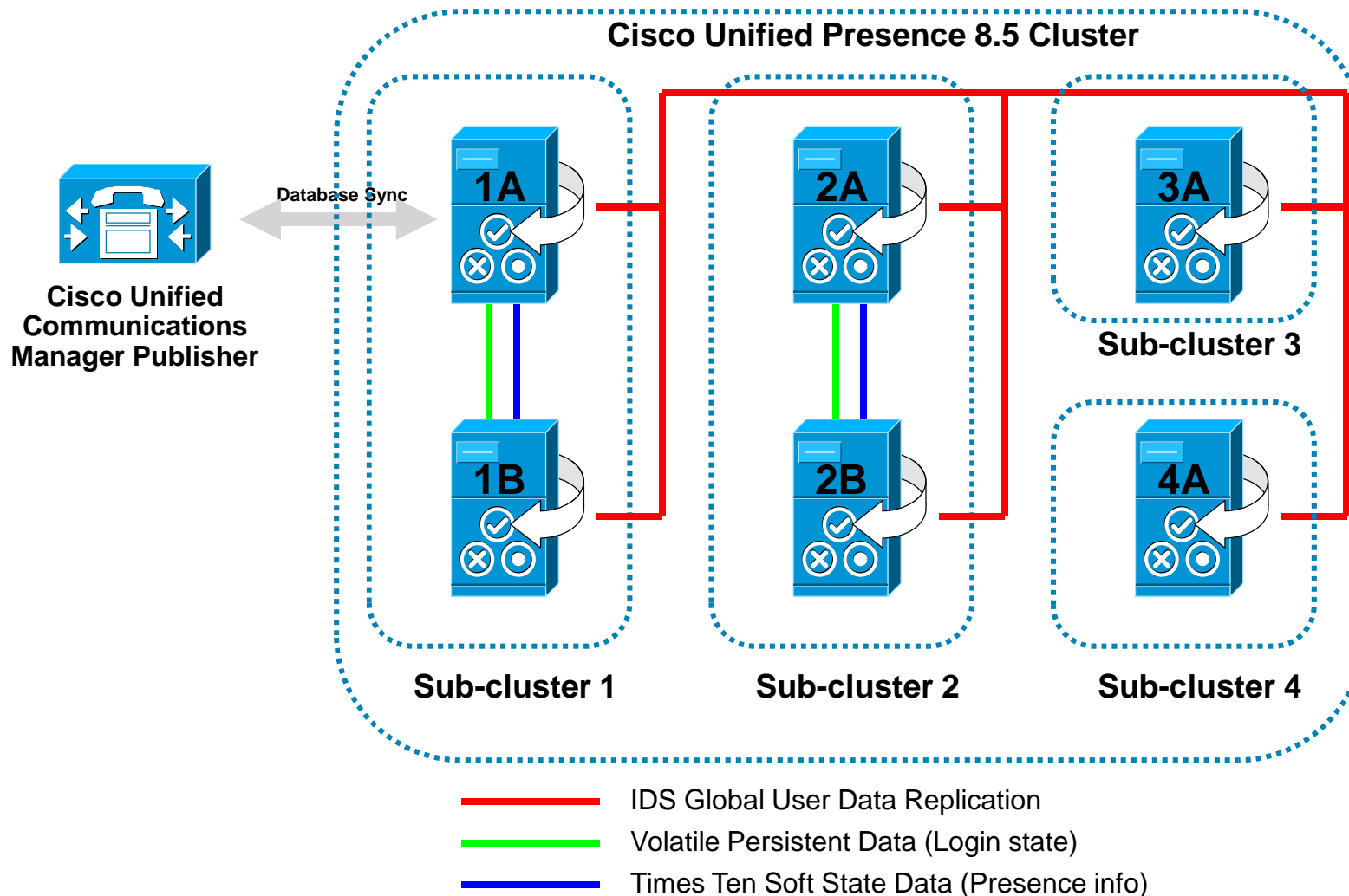
Cisco Unified Presence
Failover
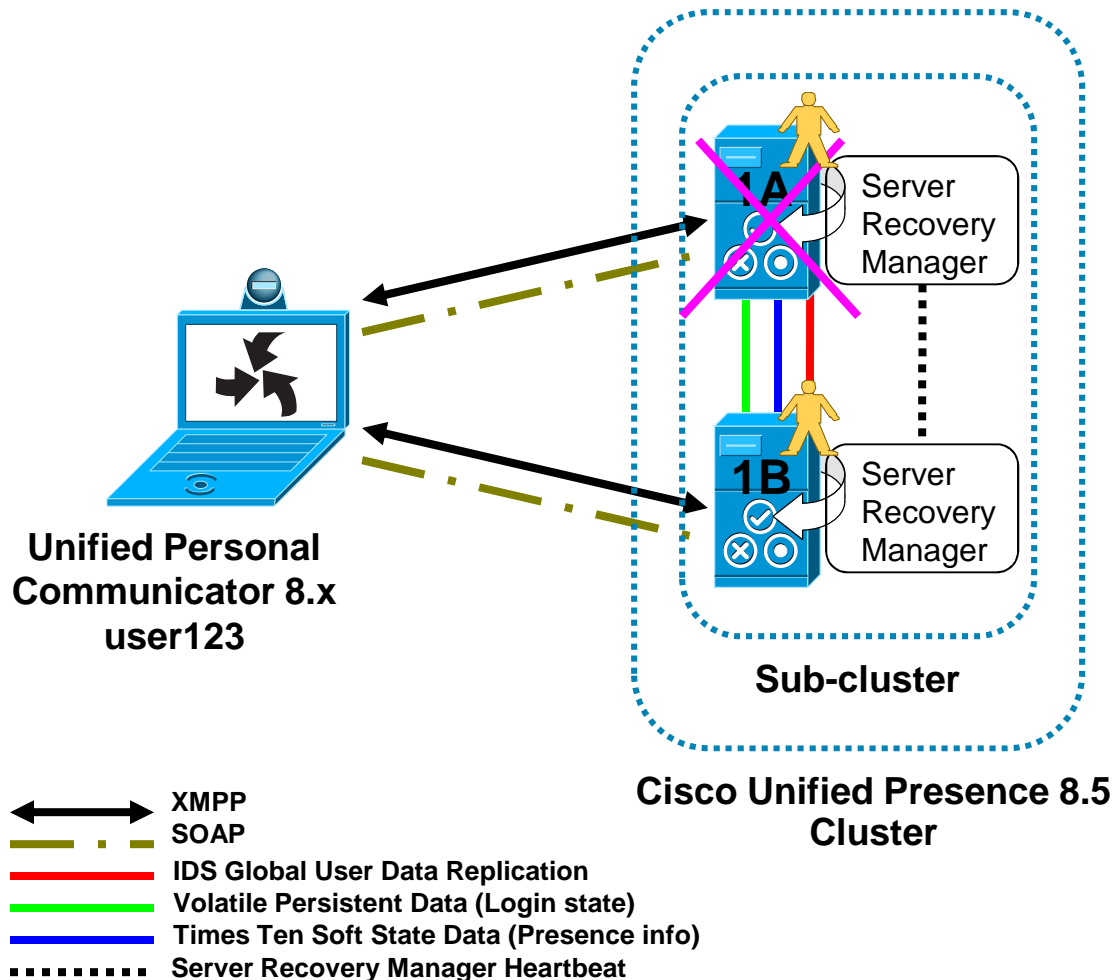
Server Recovery Manager determines a process is no longer communicating and initiates a user move operation from 1A to 1B.

User123 moved from home server 1A and is now homed to server 1B

Unified Personal Communicator 8.x user123

Sub-cluster

Cisco Unified Presence 8.5 Cluster

XMPP
SOAP
IDS Global User Data Replication
Volatile Persistent Data (Login state)
Times Ten Soft State Data (Presence info)
Server Recovery Manager Heartbeat

SRM - States

- **Initializing***:* This is the initial (transition) state when the server starts.

- **Idle**: The server is not offering any services for the end-user. Core services like the XCP Router, PE, and SIP Proxy are stopped.

- **Active Normal**: The server is operating normally, i.e., there is no service failure/failover that has happened.
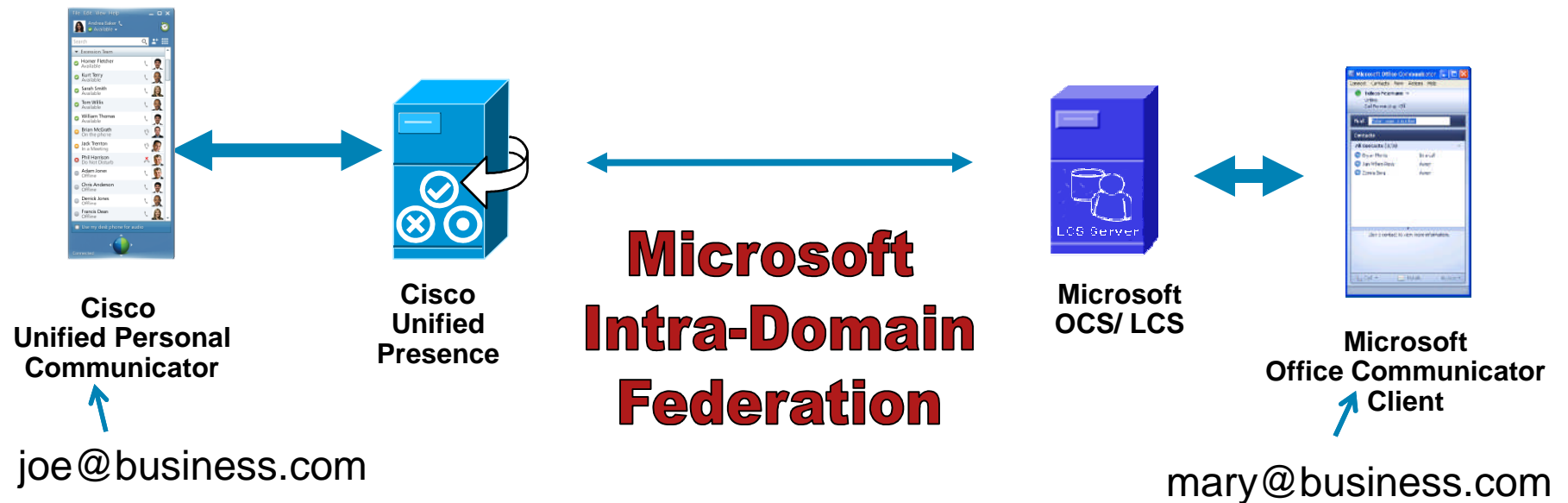
- **Backup Activated**: The server is acting as the backup for its peer node (the users have been moved to it)

- **Failed Over***:* The server has failed over, but no longer has any critical services down. In this state the node is capable of falling back.

- **Failed Over with Affected Services***:* The server has some of its critical services stopped or failed; hence the server is in a service affected condition. In this state, you cannot fallback to the node.

- **Taking Over***:* This is a transition state where a node is taking over for its peer.

- **Failing Over***:* This is a transition state where a node is being taken over by its peer

- **Falling Back***:* This is a transition state where fallback is occurring from the Backup Activated node

- **Taking Back***:* This is a transition state where the failed node is taking back over from its peer.

- **Failed***:* This is a state where an error occurs during the transition states *or Backup Activated* state. The peer state will go to Failed as well. Admin must use "Recover" option from GUI.

Cisco Unified
Personal
Communicator

CISCO

Federation

Public
Network

Cisco
Adaptive
Security
Appliance

Presence &
IM

Cisco Unified
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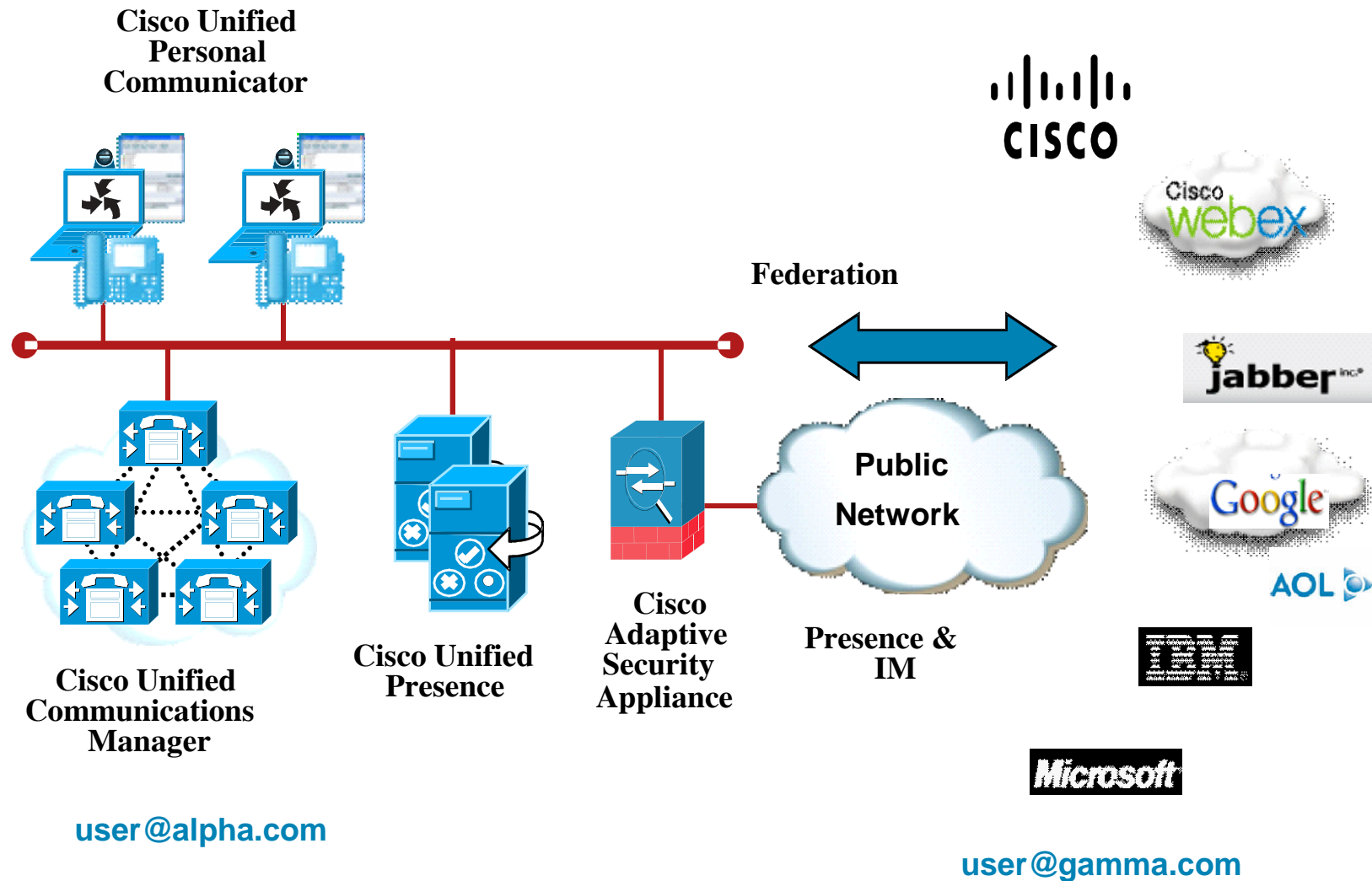
Cisco Unified Presence

Intra-domain federation between CUP and LCS/OCS

Cisco Unified Personal Communicator

joe@business.com

Cisco Unified Presence

Microsoft Intra-Domain Federation

Microsoft OCS/ LCS

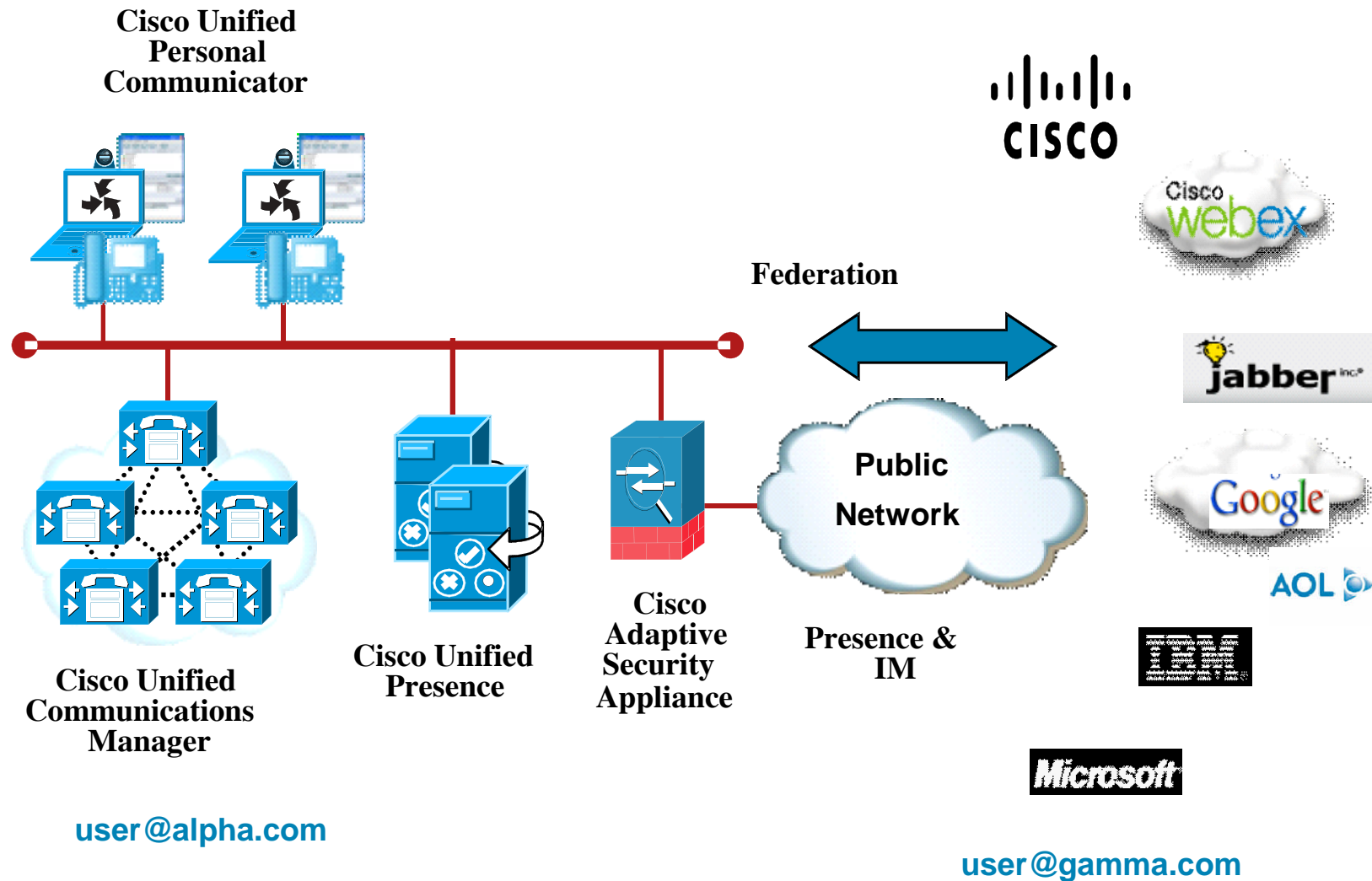**Microsoft Office Communicator Client**

mary@business.com

- Exchange of instant messaging and Presence information in the same business – between users on CUPC and users on MOC

- All users have the same addressing and access to the same back end directory

Cisco Unified Presence Compliancy

- **Instant Messaging compliancy is a market requirement in many verticals, strict guidelines set by**

  - SOX, HIPAA, DOD, EU Directives etc..

- **Cisco Unified Presence 8.x addresses market need in two ways**

  - Providing Cisco Unified Presence solution to push Instant Message records to a customer supplied PostgreSQL dB

  - 3rd Party IVT tested solution to interface to eDiscovery systems. Solution from Facetime, targeted to be available at Cisco Unified Presence 8.x FCS

- **Cisco Unified Presence 7.1 solution for Instant Messaging retention / compliancy available via SIPERA**

  - http://www.cisco.com/en/US/prod/collateral/voicesw/ps6788/vcallcon/ps6837/product_bulletin_c25-562576.html

Cisco Unified Personal Communicator

Federation

Public Network

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Presence & IM

user@alpha.com

user@gamma.com

Presence Roadmap

(Preliminary - Dates Subject to Change)

CY Q4 10 | CY 1H 11 | Following 12 months

8.x(4) MR
(8.5 Sys Align)

**CUP 8.5
(Orangefield)**
- **HA/CoW**
- TCO
- Scale
- EU Privacy
- Exchange 2010
- AOL federation,

8.5(2) MR
- Quality/CSAT focus
- UHG Support
- Lync Support

CUP 8.6:
(Brees)
  Platform alignment:
Redhat, SELinux, VMWare for HP,IBM (Lightsail), initial **HCS automated upgrade**
Customer commitments/needs:
Partition intra-domain with OCS, 100% Calendar scale, HA (2 fixes) ,

Key Customer Commit Backlog Items
- Russian Encrpytion
- GGSG / JITC certifcation
- CSAT fixes
- Presence Tweaks – calendar, idle on all devices

CUP 9.0: pre BC / AC
(Moondance)
Baseline (System Align)
- *IPv6*
- *Presence Enabled Routing*
- *Single Sign On*
- *Alpha Uri*
- *Video Presence,*
- *Licensing architecture*

Customer
- *CUPC feature support*

Othe key backlog items:
- *Carry over items from 8.6*
- *Microblogging*
- *Mega cluster + above scale*
- *Geo-location*
- *Group Policy*
- *JITC/FIPS,*
- *Intra-domain federation with Webex*
- *Al-VOS Phase 2*

EOL of CUP 6.0 – January 2010

EOL of CUP 7.0 – 1H CY2011

PANEL : ICDT SPACOMM

**Converging Telecommunications:
Paved Ways or Plenty of Bumps?**

Telecommunication and Future Internet Convergence

Eugen Borcoci,
University "Politehnica" Bucharest

NexComm 2011Conference, April 18-22 Budapest

Telecommunication and Future Internet Convergence

- **Convergence issues (samples)**
  - **Business models,**
    - New roles of entities, diversification of services,
  - **Considering " service/user/media orientation"** and needs for future networks services and applications
  - **Architecture** (just one sample):
    - Still keeping the classic separation between service/application layer ??, or
    - Introduce new paradigms at the network layer concerning **content awareness** at network level (stronger coupling between transport/ application – not like in NGN..)??
    - **Virtualization** -how to apply it effectively the in various context?
  - **Security** (services, network, …)
  - **Network "neutrality"- strong debates**
    - Amount of control (centralised/distributed)
    - Service differentiation – what degree?, what about the old "Best effort"?
  - **L1, L2 L3 (heterogeneous) technologies: how can they co-exist?**

"Convegent" System Example- research project

- **FI-oriented project:**

- **ALICANTE, 2010-2013, FP7 Integrated Project (IP): MediA Ecosystem Deployment Through Ubiquitous Content-Aware Network Environments**

- Applying new challenging concepts (Future Internet – oriented) of
    - **Content Aware Networking**
    - **Network Aware Application**
- Proposal of a novel virtual Content-Aware Network (CAN) layer
    - as a part of a full layered architecture
    - focused, but not limited to, on multimedia distribution with QoS assurance
- The system supports on a flexible cooperation between
    - providers
    - operators and end-users
    - users may access the offered multimedia services in various contexts and also to become private content providers.
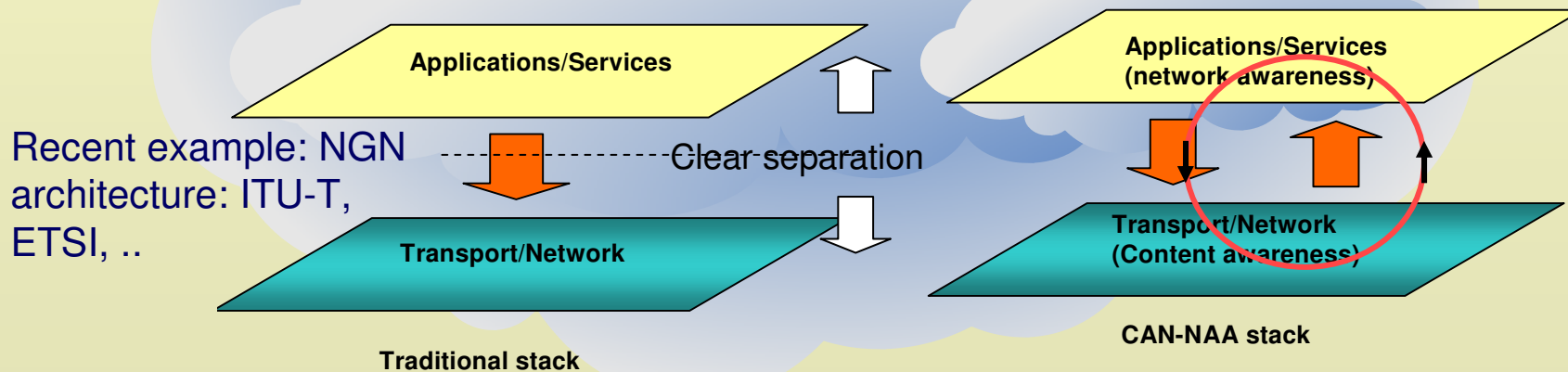
"Convegent" System Example- research project – cont'd
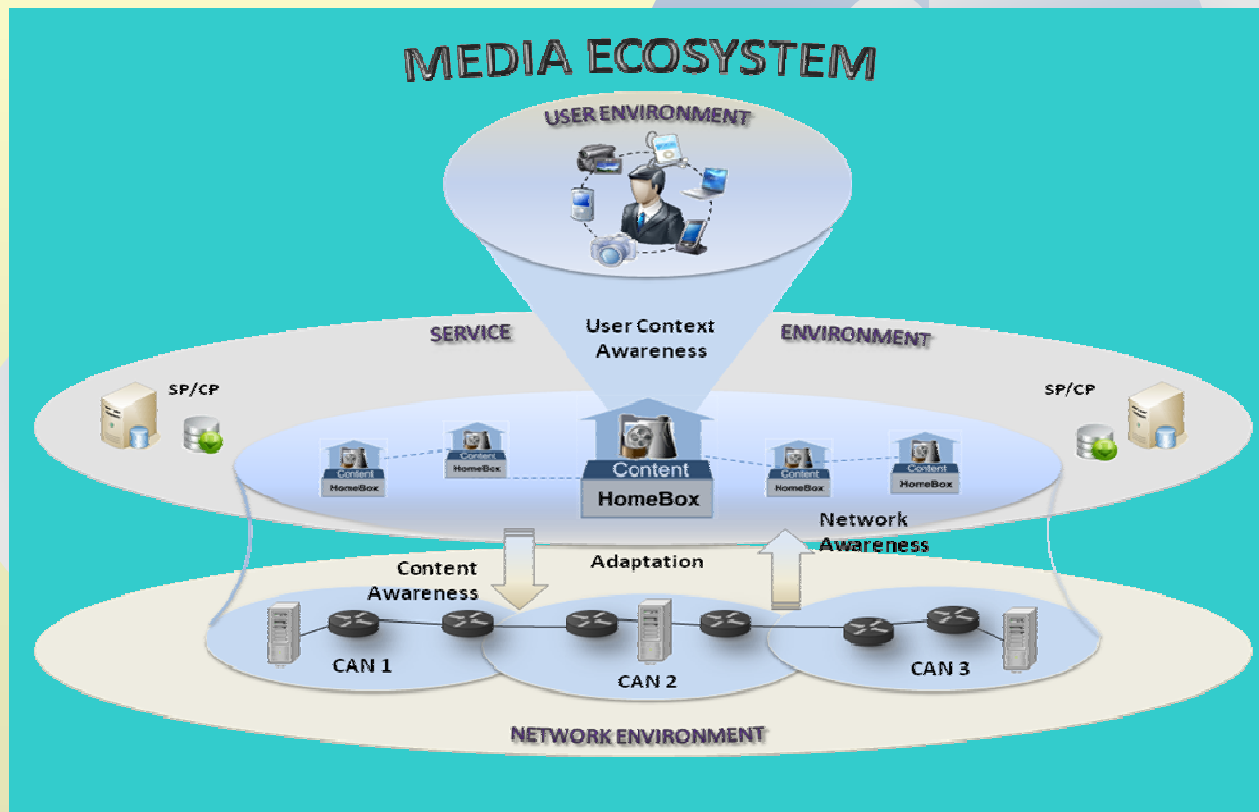
- **Content-Aware Network (CAN) and Network Aware Application (NAA) - Concepts**

  - Question: can one enable better interactions (content-network) but still preserving the architecture modularity?

  - CAN : adjusting network resource allocation based on limited understanding of the nature of the content

  - NAA: network-aware content processing : adjusting the way contents are processed and distributed based on limited understanding of the network condition

Recent example: NGN architecture: ITU-T, ETSI, ..

Applications/Services

Clear separation

Transport/Network

Traditional stack

Applications/Services (network awareness)

Transport/Network (Content awareness)

CAN-NAA stack

- **ALICANTE project:**
  - Architectural high level view

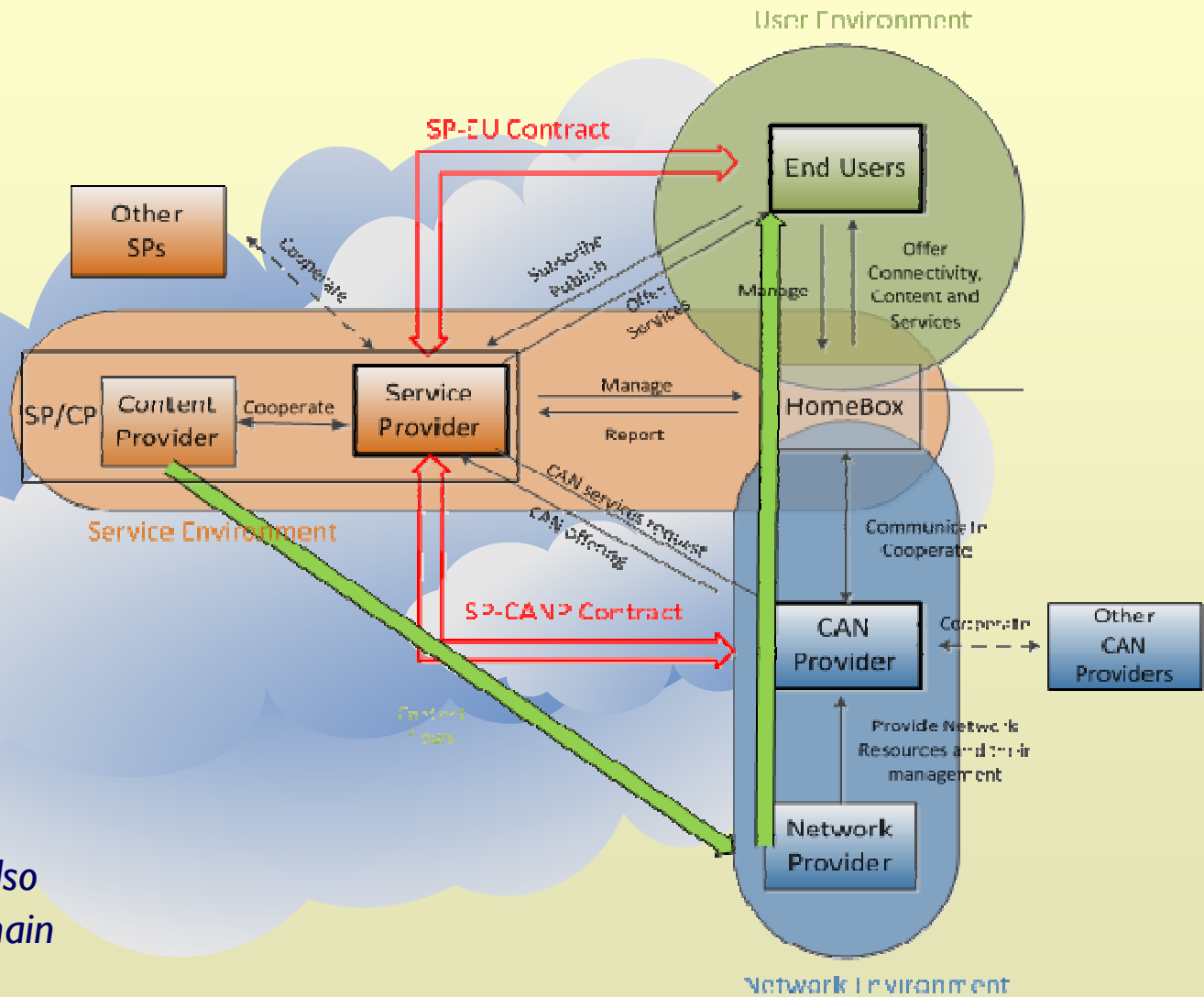# ALICANTE business actors and relations

3 key business actors:

- End-User
- Service Provider
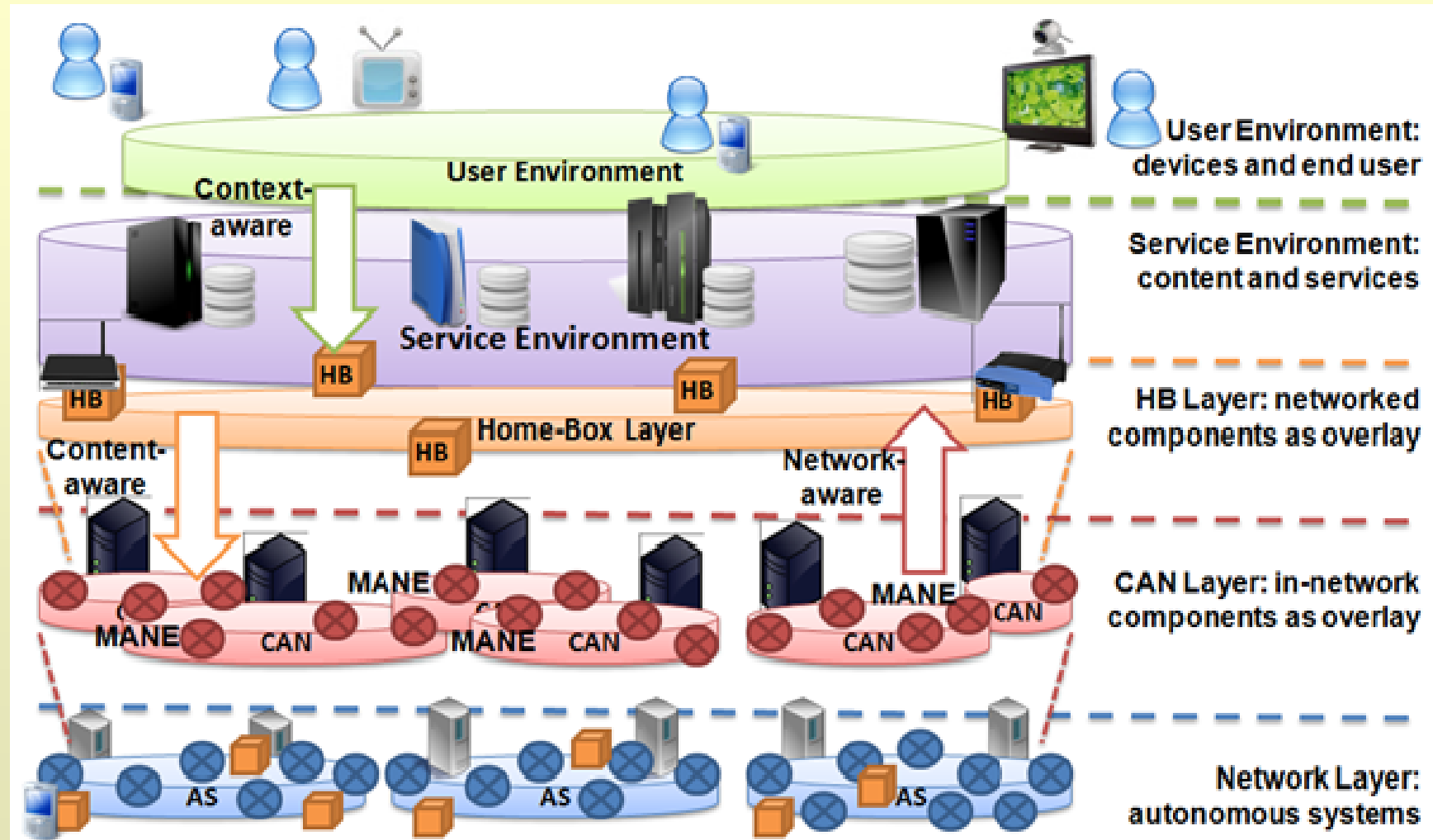
  (Note :SP may include
  also CP role)

- CAN Provider

**2 main types of
contracts (SLAs):**

- SP-EU contract
- SP-CANP contract

  *(CANP-CANP contracts also
  exist in case of multi-domain
  VCANs)*

6

5/7/2011

ALICANTE system high level view

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5/7/2011

Thank you!

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5/7/2011

Spacomm2011 Panel Discussion

Converging Telecommunications: Paved ways or plenty of bumps?
Perspective from Deep Space Communications

Timothy Pham

California Institute of Technology

Jet Propulsion Laboratory

April, 2011

Observations on equipment/products

- Good convergence between commercial and R/D segments
  - Technology maturity minimizes the need for specially-designed equipment
    - e.g., HEMT, low loss receiver/telemetry processors, VOIP

  - Technology maturity in general purpose hardware helps reducing development and maintenance cost
    - e.g., FPGA/SDR

  - Increased security exposure, due to use of commercial apps
    - Dependency on the OS and other web-based tools (browsers, flash, …)

Observations on operating frequency

- Challenges with moving to higher frequency to enhance performance
  - Current transition from X-band (8.4 GHz) to Ka-band (32 GHz)
    - New operation concept needed to compensate increased atmospheric sensitivity at higher frequency:
      - frequent data rate changes within the pass
      - increased spacecraft buffering data
      - automated retransmission

  - Future migration toward optical communications
    - Many challenges with :
      - High noise background if operated in day time
      - new operational concept if operated in night time only
      - antenna pointing at optical frequency