

**Architecture *Plus* Seminar:
Cloud Computing, Web 2.0 and Beyond: A
Vision of Future Government Operations**

**The Cloud Paradigm Shift: A
Case Study, The City of Los Angeles**

August 13, 2009



Cloud Computing – A new paradigm

No Savings



“Current cloud computing offerings are **not cost effective** compared to large enterprise data centers”

Meh - lotta hype – Nothin New



“We did **time slicing in the 70’s** they gave it fancy new name”

Complete Gibberish



Maybe I’m an idiot, but I have no idea what anyone is talking about. What is it? It’s **complete gibberish. It’s insane.** When is this idiocy going to stop?

- New cost models
 - Scale on-demand
 - Improved efficiency
- A different Operations model
 - Service oriented
 - Elastic infrastructure and platforms
 - GE moved 400,000 desktops to Zoho
- Who moved my cheese?
 - A different paradigm



VS



Why is Cloud Computing Relevant?

- IDC – Cloud Services will be \$42B by 2012
- Gartner – Cloud Services will be \$150B by 2013
- Merrill Lynch – 12% of global SW will move to cloud
- By 2011, 30% consulting and systems integration will be delivered via cloud computing
- By 2012, 20% of enterprise e-mail will be delivered in the cloud
- By 2011, 25% of new business software will be delivered as software-as-a-service (SaaS)
- Security SaaS is emerging as one of the fastest-growing sectors in an exploding market that is forecast to reach USD\$10.7B by 2009 (IDC)
- SaaS is disrupting the \$18B IT management software market and will grow to own 10% of this market by 2011
- IT service management SaaS will capture 20% of \$18B market



The IT services and outsourcing market is currently undergoing a structural transformation that will have a profound effect on how IT service providers will have to conduct their business.

Market forces of commoditization, miniaturization, industrialization, and globalization, along with changing buyer sentiments, will accelerate a shift in the dominant form of IT delivery by 2012 — from buyers self integrating technology to outside providers assembling and managing it for them.

As service providers prepare for these changes, they are looking to redesign their solutions portfolio as well as their underlying go-to-market and delivery approaches.

By 2012 the dominant model for delivering technology to end-user companies will be through services.

Cloud computing is:

- the name given to a new IT paradigm which enables organizations to consolidate and share computing resources by eliminating physical hardware and replacing that equipment with virtual, non-dedicated machines
- delivered mainly by commercially available 'public' clouds today; however 'private' clouds are beginning to emerge
- shifting the focus of IT organizations from building on-premise solutions to integrating SaaS solutions which provide best-value mission outcomes
- being used to unlock the information behind the firewall to enable improved transparency and engagement with end-users
- a rapidly growing and changing market with many different vendors – both new and established – offering compelling point solutions
- an area where our clients are increasingly asking CSC for advice and assistance

Benefits of Cloud Computing Services for the Public Sector Customer:

- Potential for significant cost savings over on-premise solutions
- Platform for providing new IT services to citizens and employees
- Ability to very rapidly and inexpensively scale-up/down and create new business services
- Ability to support Green IT and Telework initiatives
- Re-focus new capital investments to other more mission critical outcomes



Cloud computing is a pay-per-use model for enabling available, convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, services) that can be rapidly provisioned and released with minimal management effort or service provider interaction.



Self-service provisioning
Shared resources/common versions
Offsite third-party provided
Access via the Internet
Standard usage-based pricing

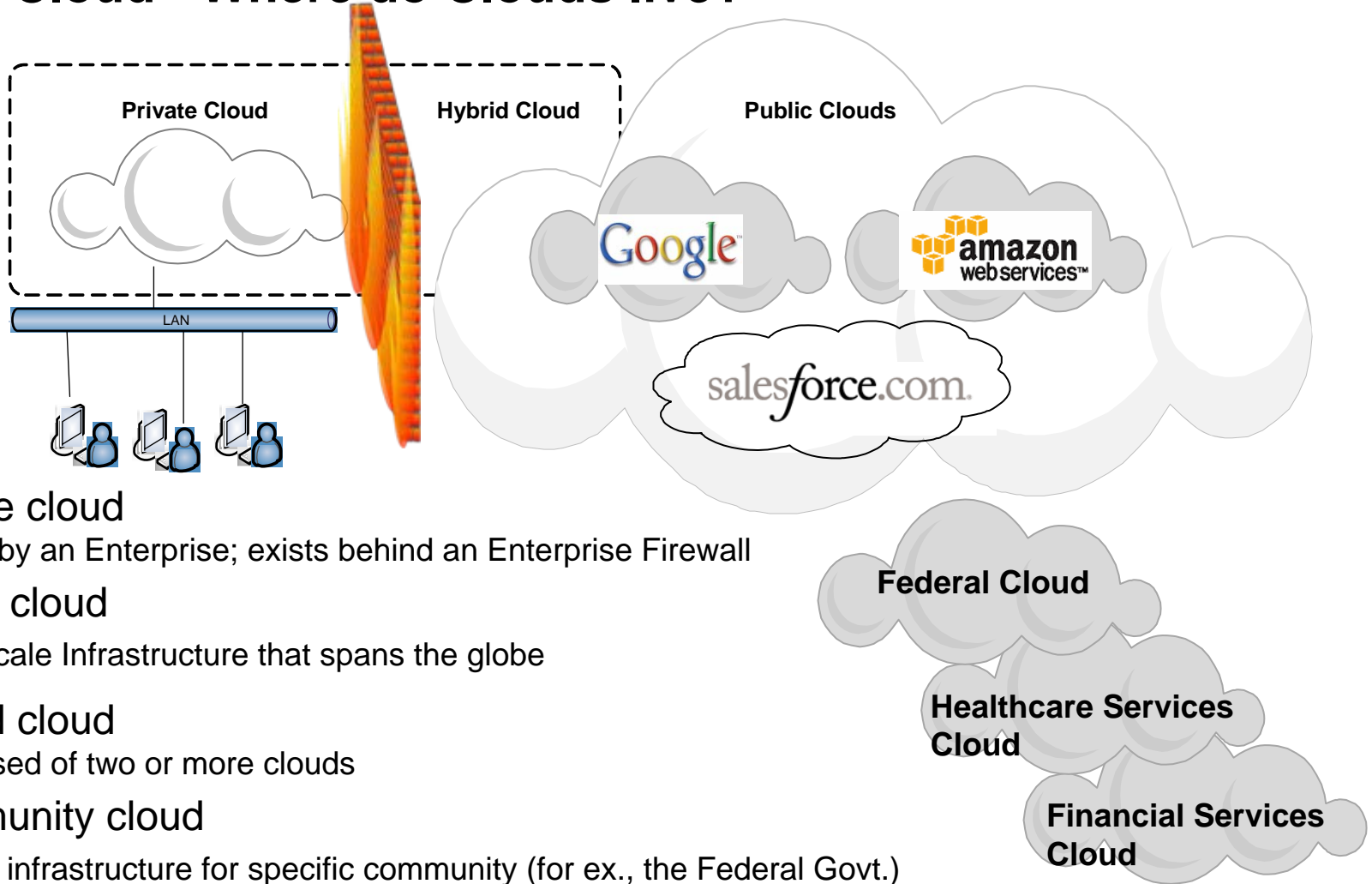


A form of standardized IT-based capability — such as Internet-based services, software, or IT infrastructure — offered by a service provider that is accessible via Internet protocols from any computer, is always available and scales automatically to adjust to demand, is either pay-per-use or advertising-based, has Web- or programmatic-based control interfaces, and enables full customer self-service.



A style of computing in which massively scalable IT-enabled capabilities are delivered “as a service” to multiple customers using Internet technologies

Types of Cloud - Where do Clouds live?



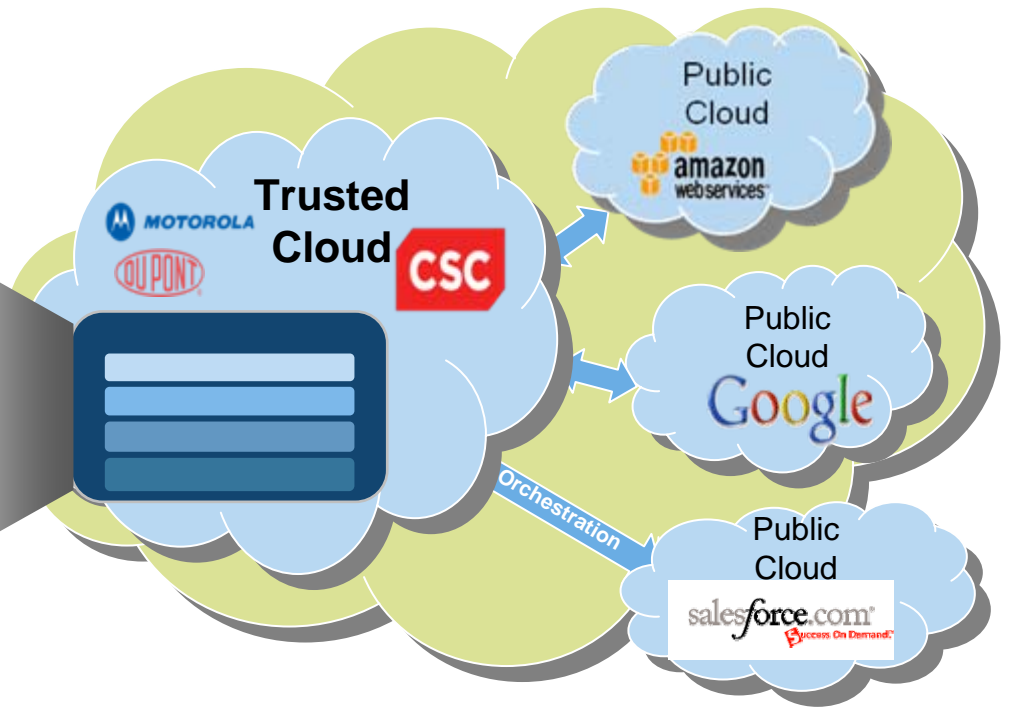
- **Private cloud**
 - Owned by an Enterprise; exists behind an Enterprise Firewall
- **Public cloud**
 - Large scale Infrastructure that spans the globe
- **Hybrid cloud**
 - Comprised of two or more clouds
- **Community cloud**
 - Shared infrastructure for specific community (for ex., the Federal Govt.)

As clouds proliferate, there will be a need for portability and interoperability to ensure that users can fully leverage everything clouds have to offer

CSC Cloud POV

Cloud Type

Service Stack Layer



Service Stack Examples

- BPaaS Case Management, CRM, Financial Mgt
- SaaS Email, Collaboration, Security, Content Mgt
- PaaS Application Development, WebSite/Portal Hosting
- IaaS Compute as a Service, Storage as a Service

Essential Characteristics

- Pay-per-use
- On-demand self-service
- Multi-tenant
- Elasticity
- Ubiquitous network access

CSC Cloud Computing Offerings



Cloud Orchestration Services

Business Consulting

- ✓ Cloud Advisory Services
- ✓ Change Management and Training

Business Process as a Service

Software as a Service

Platform as a Service

Infrastructure as a Service

Managed Cloud Services

- ✓ User Provisioning and Authentication
- ✓ Service Provider Management
- ✓ Help Desk Tier I/II/III

Cloud Installation

- ✓ Case Management
- ✓ Content Management
- ✓ CloudMail & Collaboration
- ✓ eDiscovery & Security
- ✓ GeoSpatial and Maps
- ✓ Enterprise Search
- ✓ Cloud App Development
- ✓ Xplatform Integration
- ✓ WebSite/Portal

Partner Services

- ✓ Partner Selection
- ✓ Partner Management
- ✓ Channel Sales
- ✓ ISV Cloud Adoption
- ✓ Product Enablement

Proactively partnering with leading cloud computing vendors enables CSC to provide the best-value solution to our clients



Cloud Orchestration Services

SaaS Partners – CloudMail and Collaboration



- ✓ Google Apps Premier Edition (GAPE)
- ✓ Google Message Discovery (GMD)
- ✓ Google GeoSpatial and Maps
- ✓ Google Search Appliance



- ✓ Business Productivity Online Suite (BPOS)
- ✓ Exchange Online
- ✓ Sharepoint Online
- ✓ Office Live Meeting
- ✓ Office Communication Online

Business Process as a Service

Software as a Service

Platform as a Service

Infrastructure as a Service

IaaS Partners – Trusted Cloud Services



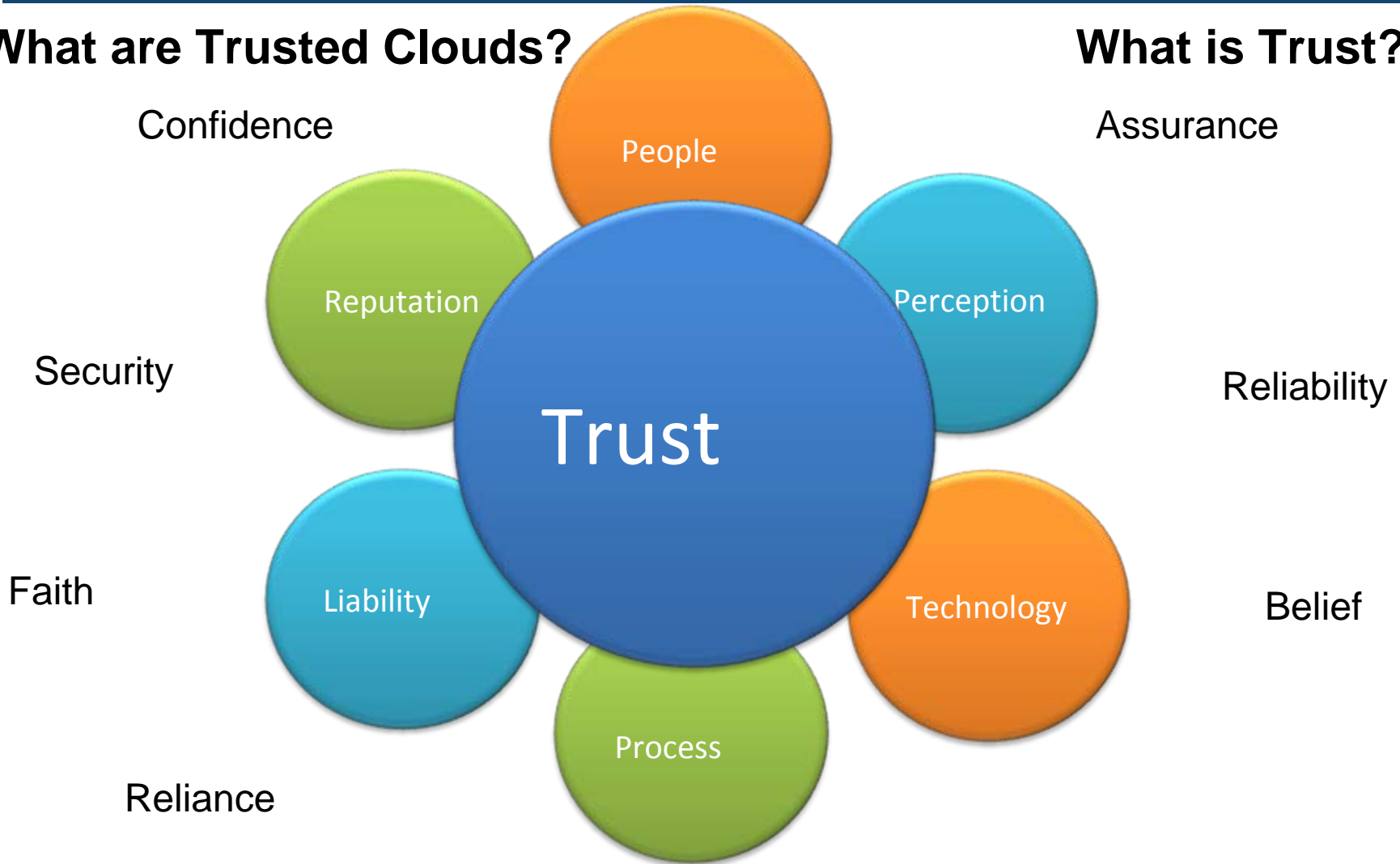
- ✓ Enterprise Cloud Reseller
- ✓ Compute
- ✓ Storage
- ✓ Managed Hosting

Sample Solution Value Cases

- ✓ Cloud Application Development
- ✓ GeoSpatial and Maps
- ✓ Hybrid Cloud Integration
- ✓ CloudMail and Collaboration Installation
- ✓ Virtual Development/Test Environments
- ✓ WebSite Hosting and Development
- ✓ Internal Employee Engagement

What are Trusted Clouds?

What is Trust?



Adapted from From Volume 1 of the Digital Trust Report series: "Digital Trust: Shaking Hands with the Digital Enterprise", part of an eight volume report published by CSC, 28 June 2007, www.csc.com/aboutus/leadingedgeforum/knowledgelibrary/uploads/LEFRReports2007_DigitalTrustVol1.pdf
(All report volumes can be found online at <http://www.csc.com/aboutus/leadingedgeforum/mds/mds436/844.shtml>)

***Trust can be defined as the assured reliance by one party
on the future behavior of another party.***

What are Trusted Clouds?

"Who are you . . . really?" to include identities for "things" as well as people

What is Digital Trust?

Ways in which digital trust is claimed, measured and acknowledged within and across the digital enterprise



Going far beyond confidentiality, digital trust for IP covers such characteristics as originality, authenticity, integrity and access-usage-rights.

Protection against threats and vulnerabilities in a "connected world"

Rules for everything seem to be everywhere. Managing compliance is expensive, but non-compliance is even more expensive

Extension of security and privacy needs to the un-tethered World

Adapted from Volume 1 of the Digital Trust Report series: "Digital Trust: Shaking Hands with the Digital Enterprise", part of an eight volume report published by CSC, 28 June 2007, www.csc.com/aboutus/leadingedgeforum/knowledgelibrary/uploads/LEFReports2007_DigitalTrustVol1.pdf
(All report volumes can be found online at <http://www.csc.com/aboutus/leadingedgeforum/mds/mds436/844.shtml>)

The pursuit of digital trust must become a common objective driving the strategy, design, deployment, and operations of Clouds

What are Trusted Clouds?

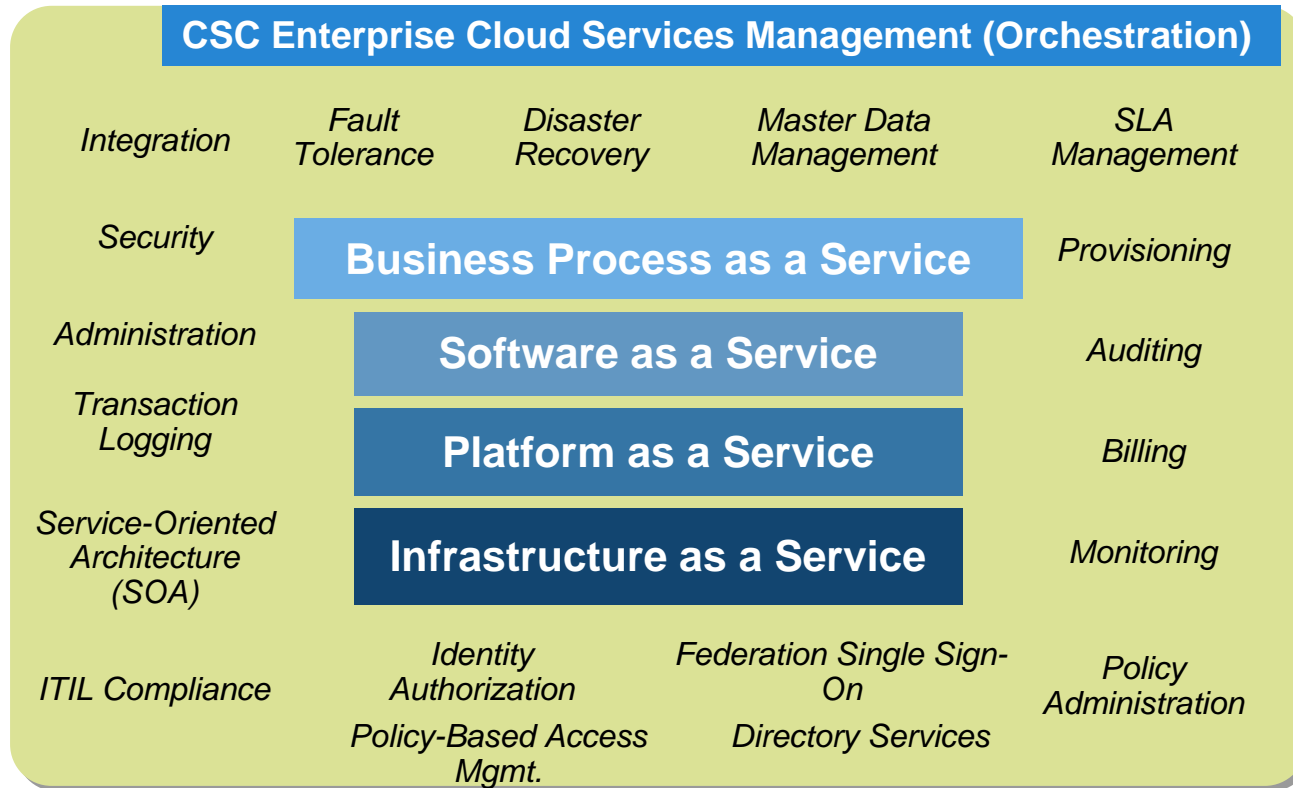
Key Elements



Key Element	Private Cloud	Trusted Cloud	Public Cloud
Security (Bunkered facilities, redundant connectivity, cleared/trusted employees, data encryption, user authentication, logging, etc.)	✓	✓	✗
Digital Trust, with comprehensive transparency	✓	✓	✗
Operational Expenditure	✗	✓	✓
Capital Expenditure	✗	✓	✓
Scalability and On-Demand Allocation	✓	✓	✓
Reliability	✓	✓	✗
Data Location	✓	✓	✗
Data Management	✓	✓	✗
Multiple Tenants	✗	✓	✓

Trusted cloud is “a cloud that harmonizes security of transactions and data, with comprehensive transparency of control and result, such that it conveys evidence based confidence that systems within its environment operate services as advertised”

Trusted cloud services ...



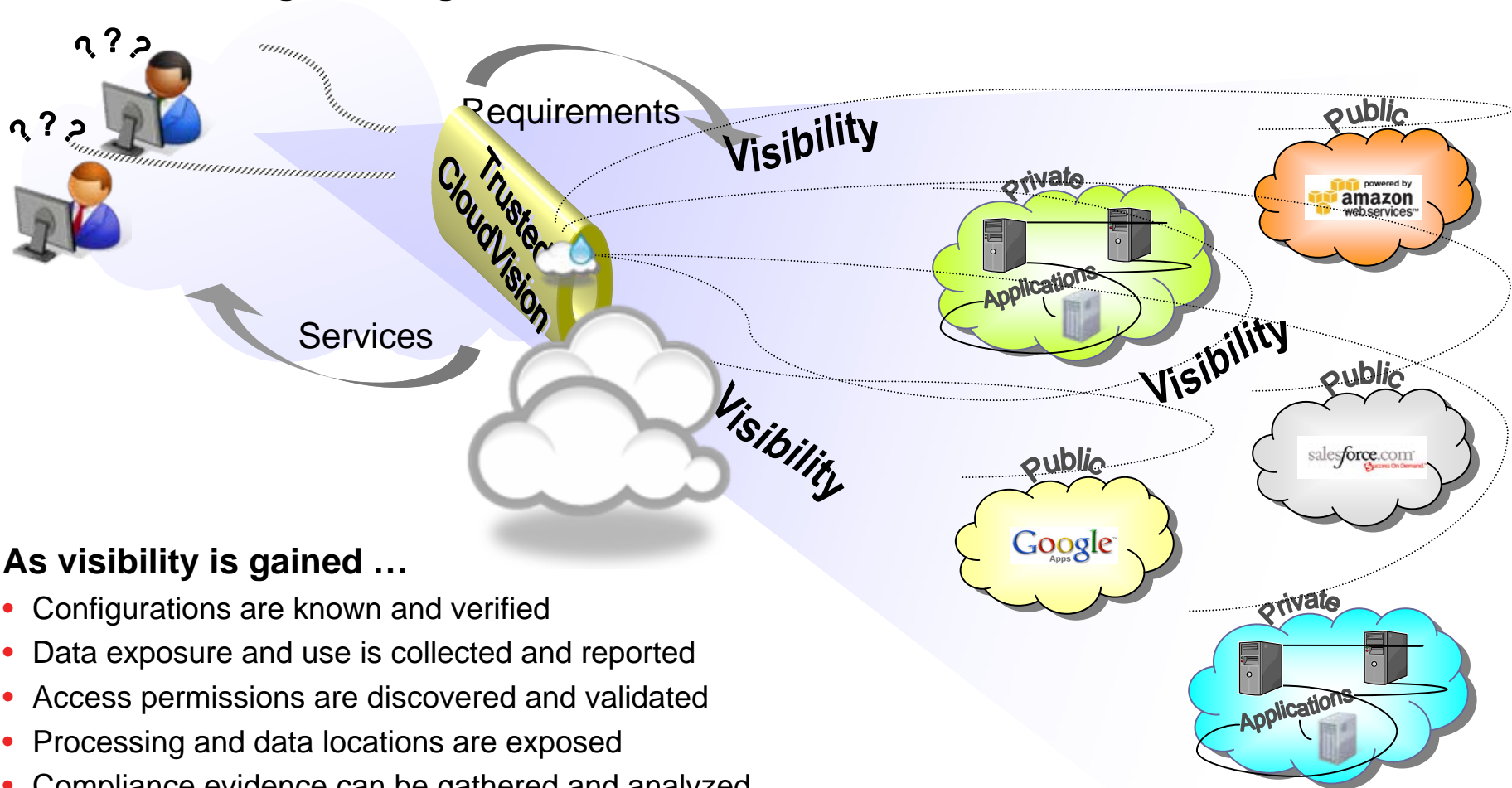
... will require orchestration, integration, monitoring, SLA management, security, monitoring, master data management, auditing, metering, billing and so much more.

Information Assurance in Cloud-Complicated

“Clouds are cloudy”

Transparency Restores Information Assurance

Working with a “glass cloud” delivers the elastic benefits of the cloud



As visibility is gained ...

- Configurations are known and verified
- Data exposure and use is collected and reported
- Access permissions are discovered and validated
- Processing and data locations are exposed
- Compliance evidence can be gathered and analyzed
- Processing risks and readiness become known

... **Security, compliance, and value are captured as well**

A “Trusted” cloud

- A cloud that ...
 - ... is secure
 - ... has transparency of control and result
 - ... conveys evidence-based confidence that systems within its environment
 - ...operates as advertised
 -is a Trusted Cloud
- Services rendered via a trusted cloud are Trusted Cloud Services

The generation of new enterprise value with Trusted Cloud Services is an application of digital trust

CSC Trusted CloudVision™ Service Foundations

Cloud User's Bill of Rights and Service Delivery Agreements



Trusted Cloud Services™

Bill of Rights

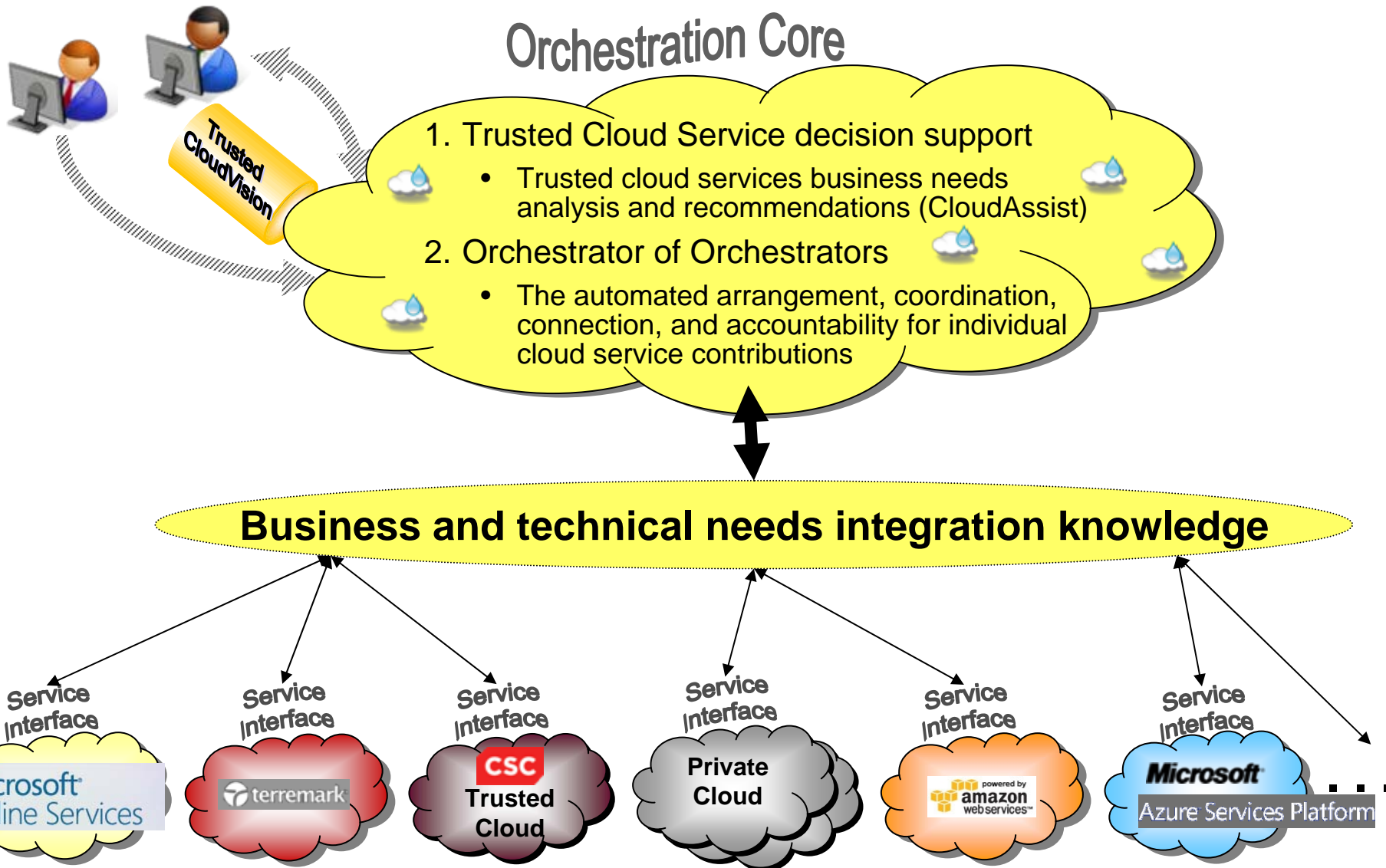
- The client owns the data
- The service provider owns the interface
- The user and the service provider own the SLA's

Service Delivery Agreement

- The user can perform an assessment of service configuration and operation at any time
- The user can anchor data and processing within the cloud

The Orchestration Core

Two important service functions



RFP Summary



Mission and Overview

The Information Technology Agency (ITA) is required to provide e-mail services to the non-proprietary departments of the City of Los Angeles. The ITA has proposed an aggressive plan to reduce IT expenditures Citywide and intends to realize some of these cost savings by replacing the City's current premise-based e-mail system with non-premise based e-mail and ancillary applications provided in a Software as a Service (Saas) model.

Key components of the project include:

- Secured Citywide e-mail solution with standard e-mail capabilities
- Calendar function
- E-Discovery (search)
- Data migration (archives and backups)
- Collaboration solutions
- Internal administrative capability
- Solutions related to office suite technologies

Training for technical personnel, implementation, and integration into the existing City infrastructure are part of the RFP. (Novell IDM, e-Director, and Microsoft Active Directory)

Statement of Work

The SaaS E-mail and Collaboration Solution will replace the City's current e-mail solution and adds collaboration tools for over forty (40) non-proprietary departments.

The City expects to replace 17,000 to 30,000 user e-mail accounts immediately. The City also discussed the contract opportunity with proprietary City departments and other local public agencies which increased the possible number of e-mail accounts to between 100,000 and 150,000.

Solution Implementation

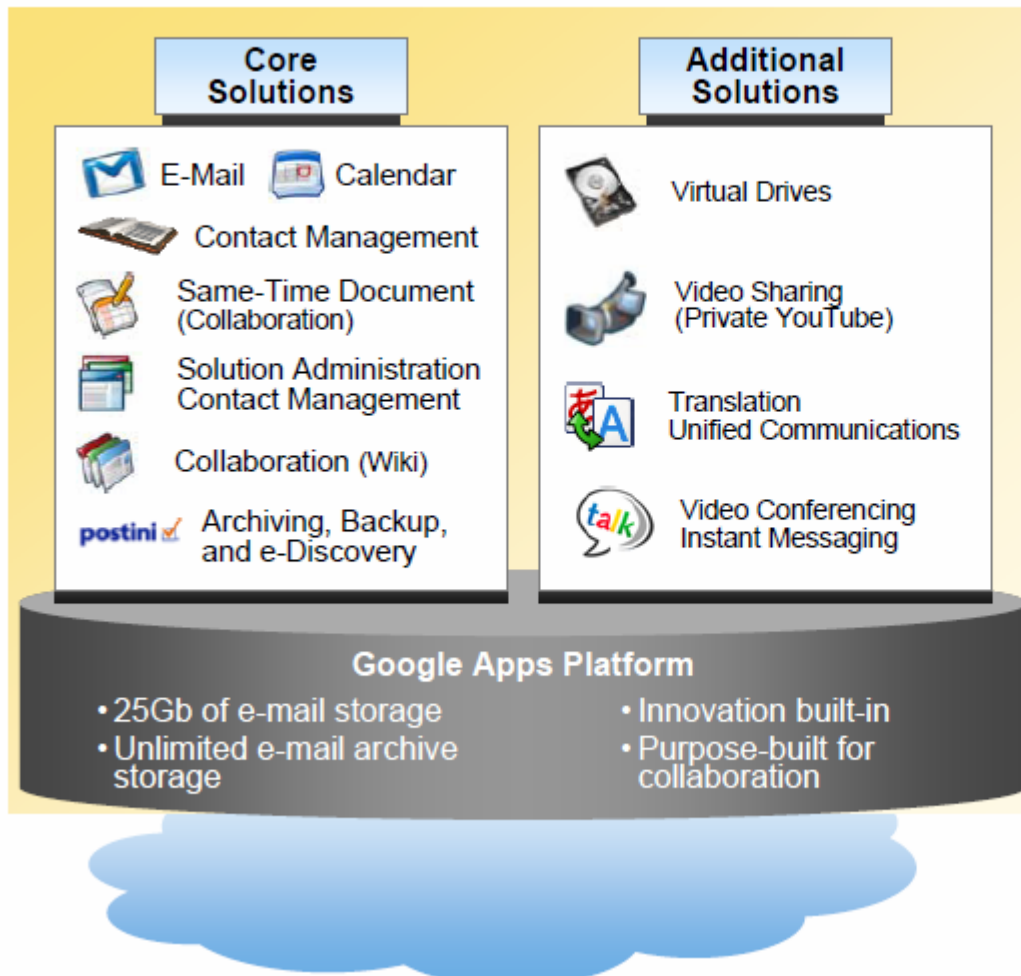
Components	Description
Installation	<ul style="list-style-type: none"> • Implement entire solution and migrate all live and historical data from existing e-mail system by December 31, 2009 • Implement entire solution including historical data migration (archive and backup) by June 1, 2010
Integration	<ul style="list-style-type: none"> • Mobile devices • Applications that use e-mail notifications • Infrastructure devices that use e-mail notifications • Novell Identity Management • Novell e-Directory or Microsoft Active Directory • Files stored on-site
Training	<ul style="list-style-type: none"> • Train-the Trainer for in-house Citywide staff (100 trainers that will train the remaining City staff) • Availability of on-line training
Security	<ul style="list-style-type: none"> • Segregation of City's data from other customers' data • Access to City's data by City staff • Access to City's data by non-City staff • City data remains within the continental United States
Materials and Equipment	<ul style="list-style-type: none"> • Provide material and equipment requirements
Service Level Agreements / Sustainability	<ul style="list-style-type: none"> • Provide SLA and sustainability details for all services proposed under the RFP Statement of Work

Additional Solutions

The City is interested in reviewing proposals that provide additional SaaS office suite technology solutions, communication services, and other capabilities.

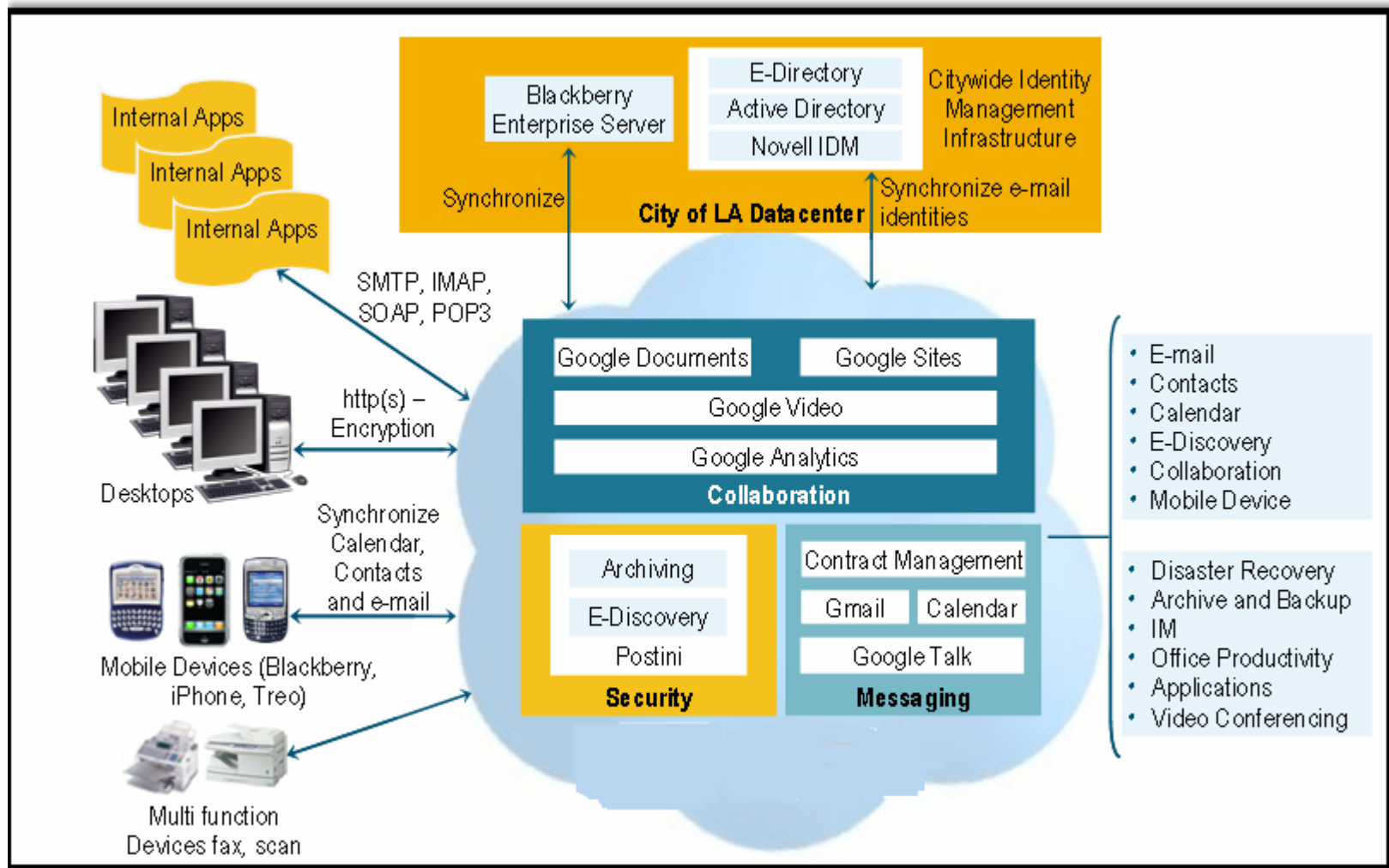
Solutions	Components
Instant Messaging	<ul style="list-style-type: none"> • Internally • Externally • Tracking Options
Office Productivity Applications	<ul style="list-style-type: none"> • Word Processing • Spreadsheet capability • Mid-Tier Database • Presentation tools • Ability to read, open, edit, and display standard office product formats
Video Conferencing	<ul style="list-style-type: none"> • One-to-one internally • Multiple locations internally • Ability to use saved video files within office productivity tools • Real-time on-screen notation
Unified Communication Services	<ul style="list-style-type: none"> • Ability to translate electronic communication • Ability to use “TTY” communication

Team CSC SECS Solution



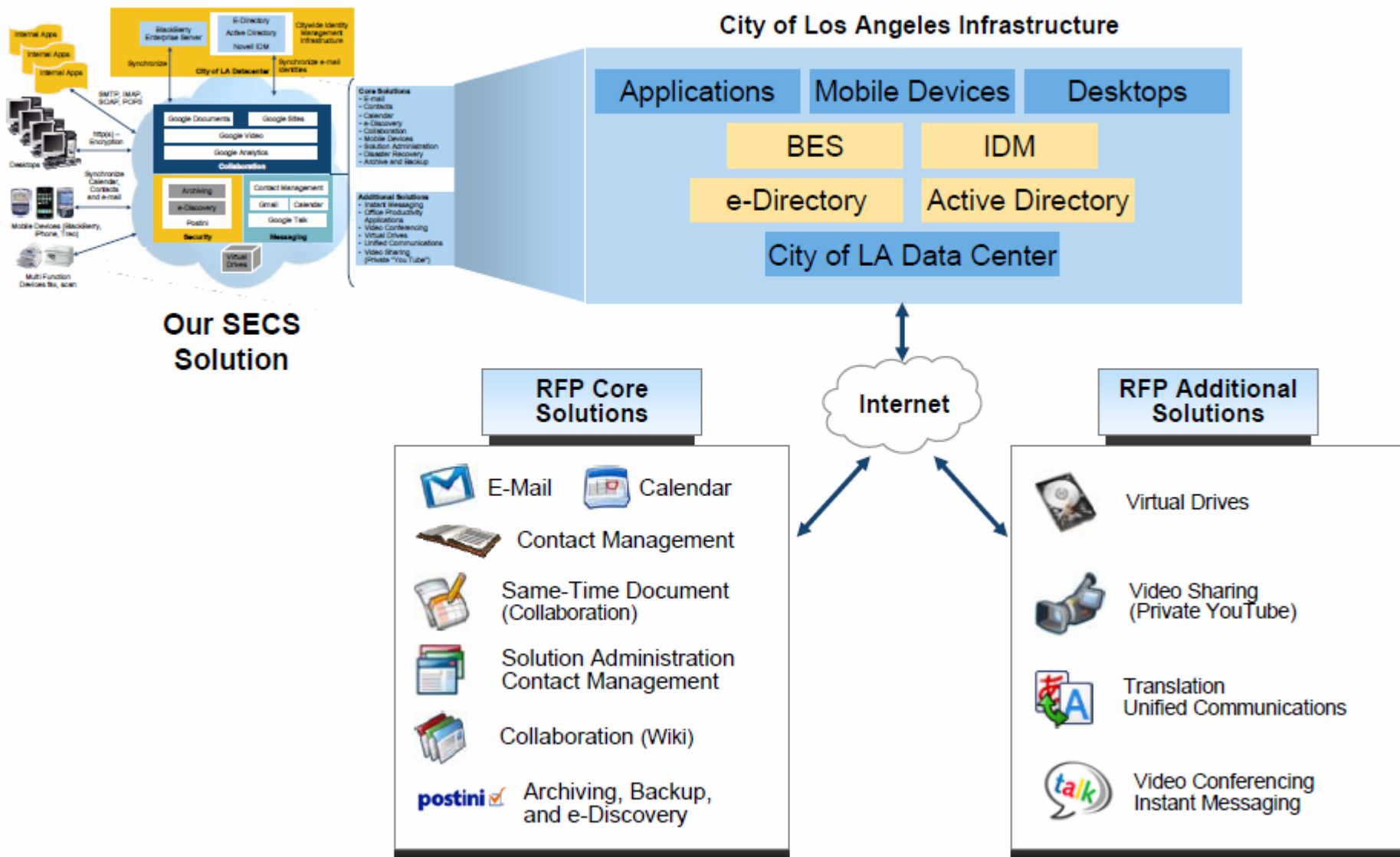
- ✓ **Low cost**
- ✓ **Simple**
- ✓ **Reliable**
- ✓ **Sustainable**
- ✓ **Meets or exceeds SECS requirements**

Conceptual Architecture

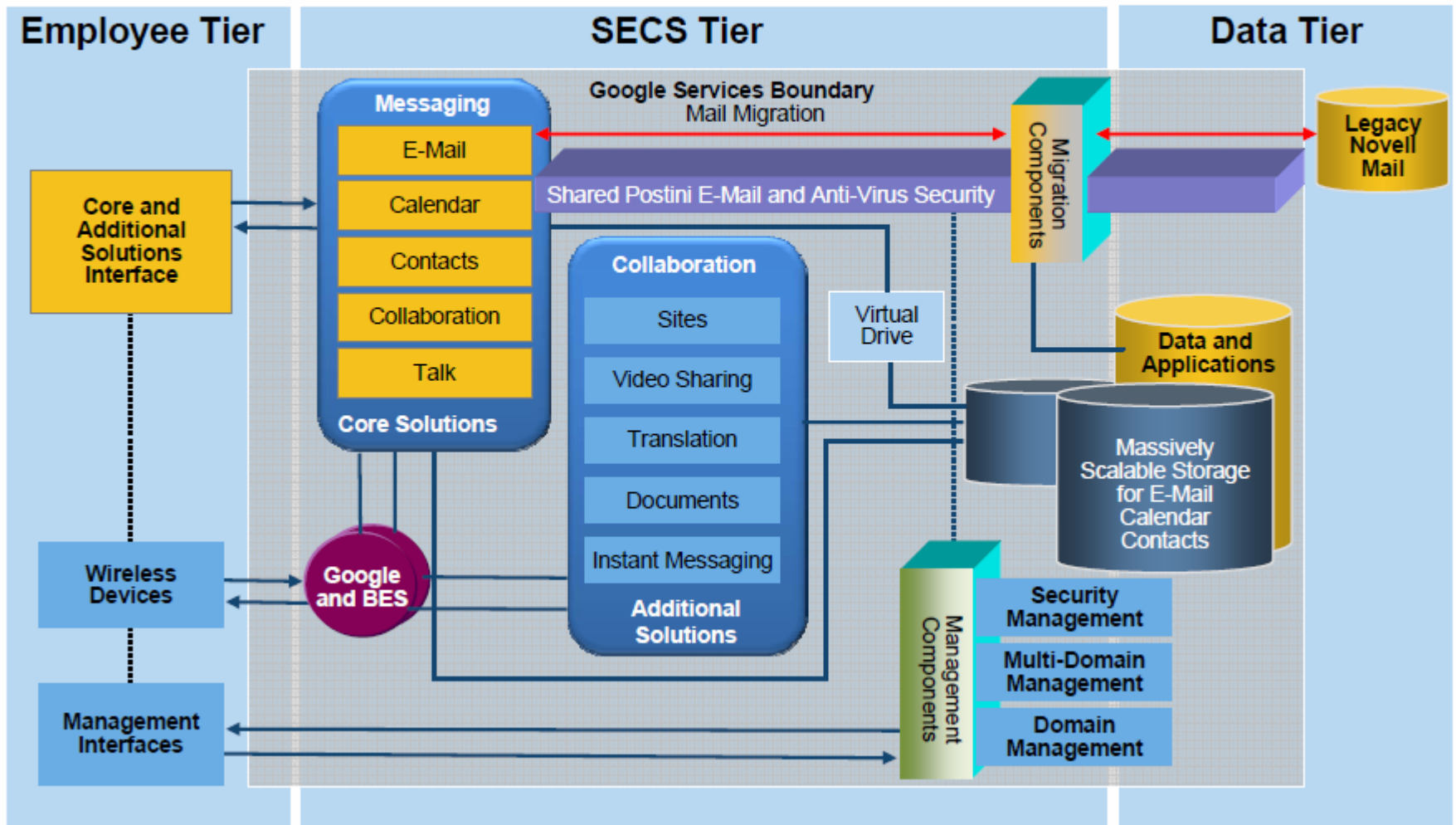


Integration with existing components and provides a innovation platform

SECS Solution Elements



Logical Architecture View





Conclusion

