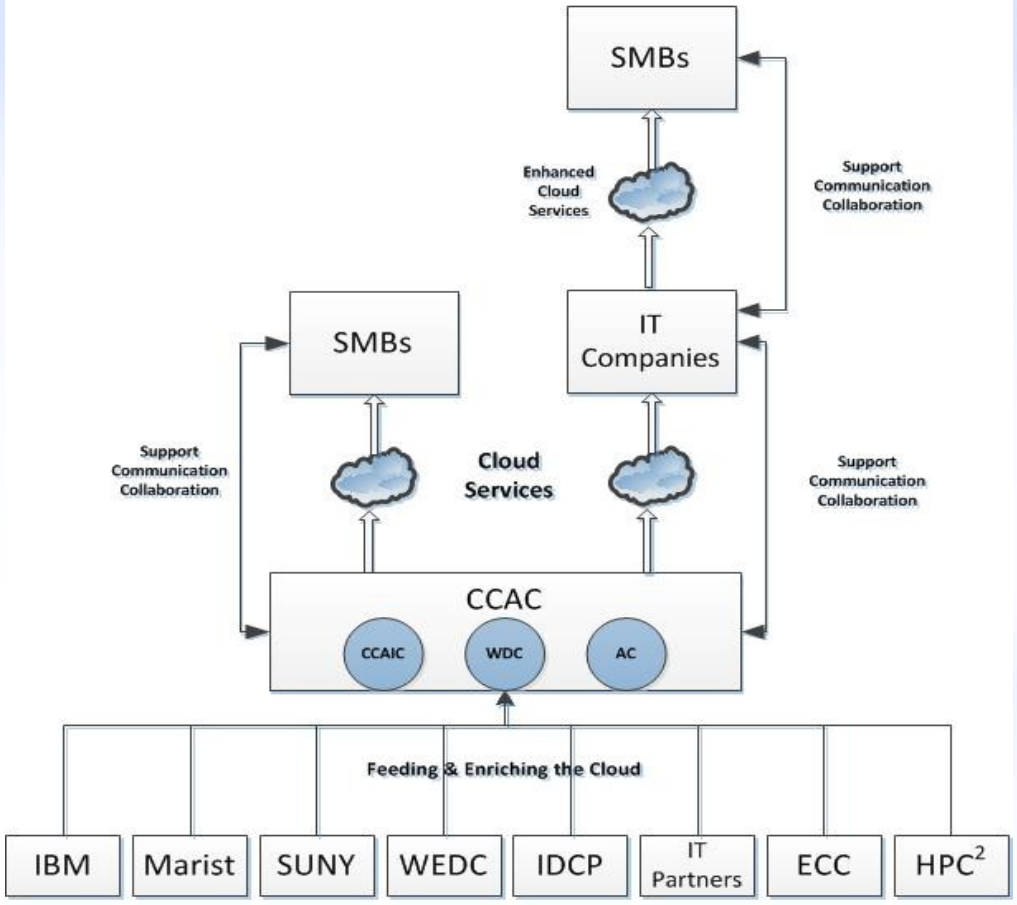
New York State Cloud Computing and Analytics Center



CCAC	New York State Cloud Computing and Analytics Center
CCAIC	Cloud Computing and Analytics Incubation Center
WDC	Workforce Development Cloud
AC	Analytics Cloud
SMB	Small/Medium Business
WEDC	Women's Enterprise Development Center
IDCP	Institute for Data Center Professionals
ECC	Enterprise Computing Consortium
HPC²	High Performance Computing Consortium

Economic Development
Through Transformational Technology

Times They are A-changin'…

Apple launched iTunes in 2003…

(continued)

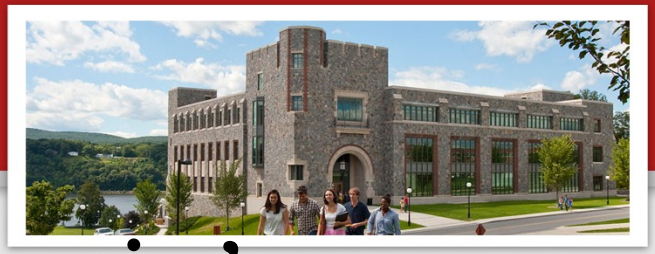
Times They are A-changin'…

Less than 5 years later this *computer company* became the largest retailer of music in the United States…

(continued)

Times They are A-changin'…

Netflix launched their mainstream movie streaming service in 2008…



Times They are A-changin'…

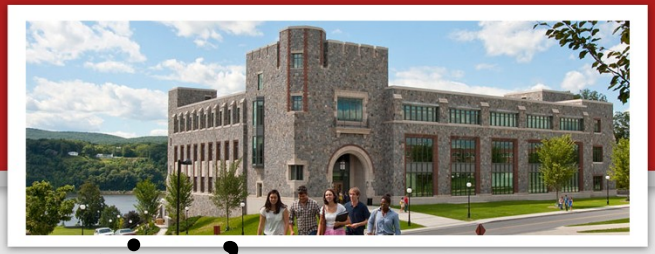
Today, they account for almost 30% of Internet traffic into US homes during peak evening hours.

(continued)

Times They are A-changin'…

Amazon started selling e-books in 2007…

(continued)



Times They are A-changin'…

In May 2011, Amazon announced that it was selling more electronic books than print.

(continued)

Disruption creates threats…

…and leads to opportunities.

MARIST
INFORMATION TECHNOLOGY

Cloud Computing:

Cloud Computing allows a company of any size, or an individual, to use the Internet to access affordable and secure storage, services, software applications, technology platforms, and IT infrastructure, paying only for the IT resources they need when they need them.

Think the Music and Movie Industry; where, in the past, everyone owned and managed their own elaborate equipment, bought CDs, DVDs, tapes, records, … Now via the cloud, you no longer have to buy expensive equipment, supporting a myriad of formats. You can own a tablet and TV, and have your music and movies streamed to you through the cloud.

Think the Knowledge Center at Marist, which provides, through the cloud, zOS images (a large scale operating system) to colleges and universities across the country (including from NYS: RPI, Clarkson, Columbia, RIT, Syracuse, DCC, NYIT, Mohawk Valley CC) so that they

MARIST
INFORMATION TECHNOLOGY

Analytics:

Analytics (also known as Business Intelligence) is software that allows companies to take control of massive amounts of information, extract actionable insights, and shape desirable outcomes.

Think **IBM Watson**, the most significant analytics system ever created, which allowed a computer system, accessing massive amounts of unstructured data, to beat the two greatest Jeopardy champions. This system is now being applied to areas such as medicine and finance.

Think the **Open Academic Analytics Initiative** at Marist, funded by the Bill & Melinda Gates Foundation, which utilizes the massive amounts of data created by course management systems, generated at a number of universities across the country, to predict academically at risk students.

Think the Marist College **Sentiment Analysis using Twitter Project**, in which massive amounts of twitter tweets are analyzed to determine in real time, country, state, or regional sentiment on topics as varied as political candidates, products, celebrities, and current issues.

MARIST
Information Technology

Open Academic Analytics Initiative (OAAI)

BILL & MELINDA GATES foundation

NEXT GENERATION LEARNING CHALLENGES
Transforming education through technology

- **$250k Grant**

- **OAAI Goal:** Develop and deploy open-source Learning Analytics "early alert" system
  - Designed to predict, within first 3 weeks, students "at risk" of not completing courses
  - Uses open-source Sakai and Pentaho Business Intelligence (BI) tools, as well as SPSS Modeler

What Is NOT Cloud Computing?

1. **Wallet test:** can you buy it with a credit card?
2. **ATM test:** do you have to talk to a person?
3. **Kick test:** do you end up owning a "thing"?
4. **Supersize me test:** can you get 10x as much of it whenever you want?
5. **Roach motel test:** can you take your app and data somewhere else whenever you want?

Source: www.keeneview.com

Cloud Computing

Mosso Google App Engine Rails One	Salesforce Gmail Gliffy	Joyent Amazon Web Svcs Nirvanix XCalibre Akamai
PaaS	SaaS	IaaS
Cloud Computing		
Utility Computing		
Grid Computing		
Cluster Computing	Super Computing	

1.0 In blue you have what is lately called Cloud Computing. In green, some of the underlying work done that led to Cloud Computing. At the top are examples of each XaaS type.

Software delivery model

- Increasingly popular with SMBs
- No hardware or software to manage
- Service delivered through a browser

Advantages

- Pay per use
- Instant Scalability
- Security
- Reliability
- APIs

Examples

- ERP
- Meetings
- Human Resources
- Office Products
- CAD Products

Commercial Services:

Google

emailcloud

Salesforce

MARIST
www.marist.edu

PaaS

Platform delivery model

- Platforms are built upon Infrastructure, which is expensive
- Estimating demand is not a science!
- Platform management is not fun!

PaaS

Popular services

- Storage
- Database
- Scalability

PaaS

Advantages

- Pay per use
- Instant Scalability
- Security
- Reliability
- APIs

PaaS

Sakai

amazon web services™

Google™ Apps

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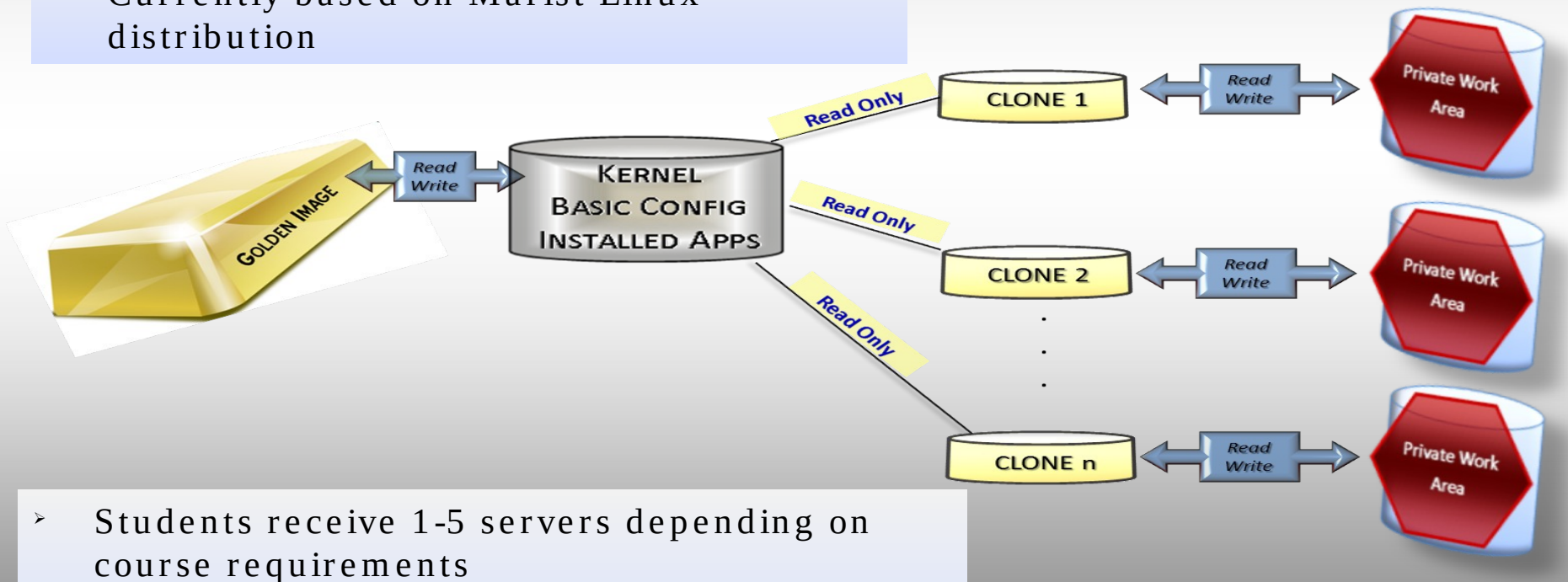
Success on System z
Student Academic Linux Servers

- Highly virtualized cost effective solution
- Currently based on Marist Linux distribution



- Students receive 1-5 servers depending on course requirements
  - Retain servers across academic career
  - Use as a portfolio and for courses

IaaS

Computer infrastructure delivery model

Access to infrastructure stack:

- Full OS access
- Firewalls
- Routers

IaaS

Advantages

- Pay per use
- Instant Scalability
- Security
- Reliability
- APIs

Examples

IaaS

MOSSO
the rackspace cloud

IBM

amazon
web services™

MARIST

SaaS

PaaS

IaaS

Common Factors

- Pay per use
- Instant Scalability
- Security
- Reliability
- APIs

SaaS

PaaS

IaaS

Advantages

- Lower cost of ownership
- Reduce infrastructure management responsibility
- Allow for unexpected resource loads
- Faster application rollout

SaaS

PaaS

IaaS

Risks

- Security
- Downtime
- Access
- Dependency
- Interoperability

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Deployed Software

Via VCL

- Windows 7
- Cognos Framework Manager
- SPSS Modeler
- MS-SQL Server 2012
- Cognos TM1 Perspectives
- DB2 Connect Client
- Cognoss Express

Via Web Brower

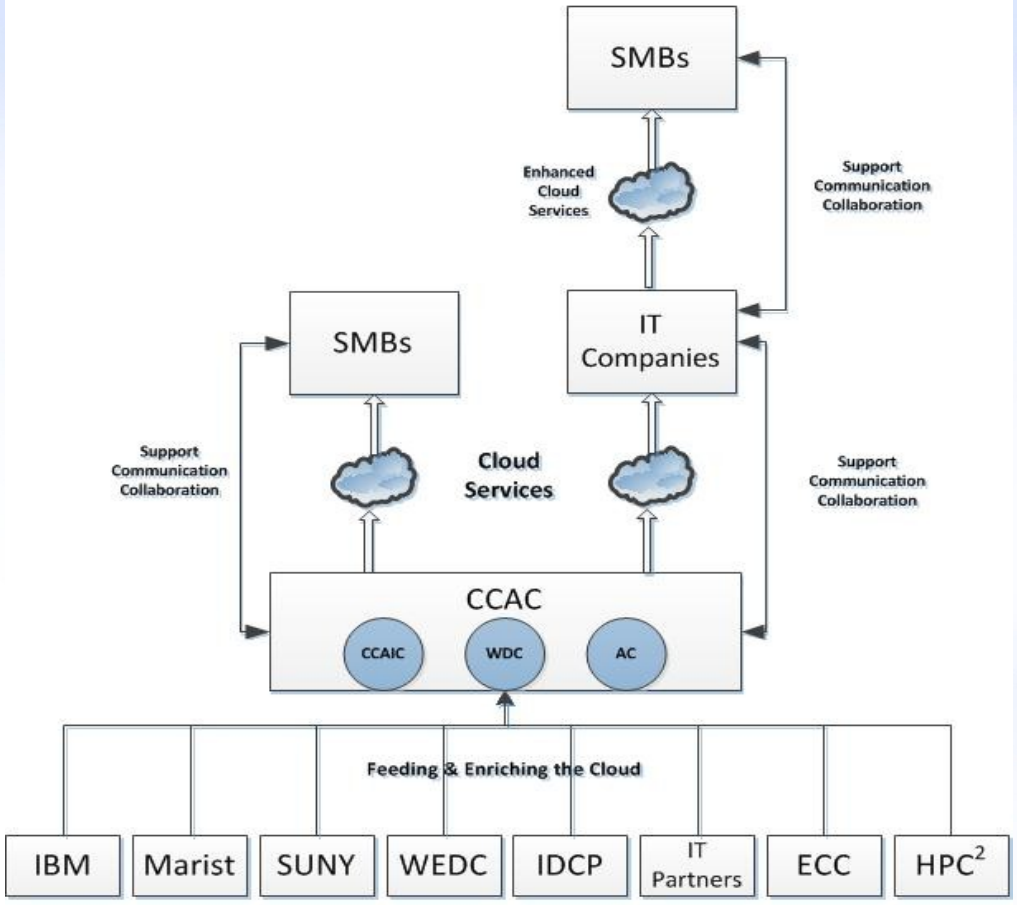
- Open Source Data Mining
- Cognos Connection

MARIST
INFORMATION TECHNOLOGY

The New York State Cloud Computing and Analytics Center

- **Saas**
  - ✓ **Business Intelligence & Data Mining Tools** (Cognos, SPSS)
- **PaaS**
  - ✓ **System Z Development Environment** (Eclipse)
  - ✓ **Course Management System** (Sakai)
  - ✓ **Social Networking** (OAE)
- **IaaS**

New York State Cloud Computing and Analytics Center



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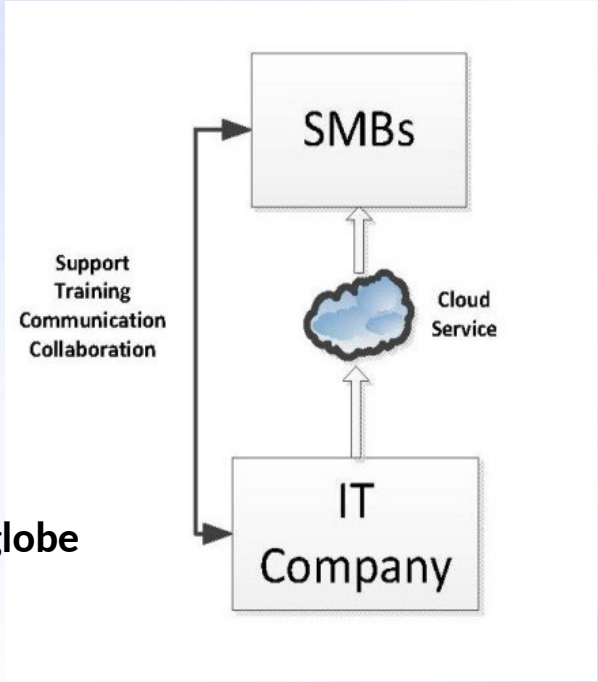
Economic Development
Through Transformational Technology

Cloud Computing

What is Cloud Computing?



Benefits to SMBs

- Access sophisticated IT SW, HW, & infrastructure
- Pay only for IT resources as needed
- Improved security
- Better disaster recovery
- Allows SMBs to focus on their core business

Benefits to Large Companies

- Frees up IT funding to devote to new applications
- Access company data from anywhere across the globe
- Provides full suite of collaboration features

Benefits to Environment

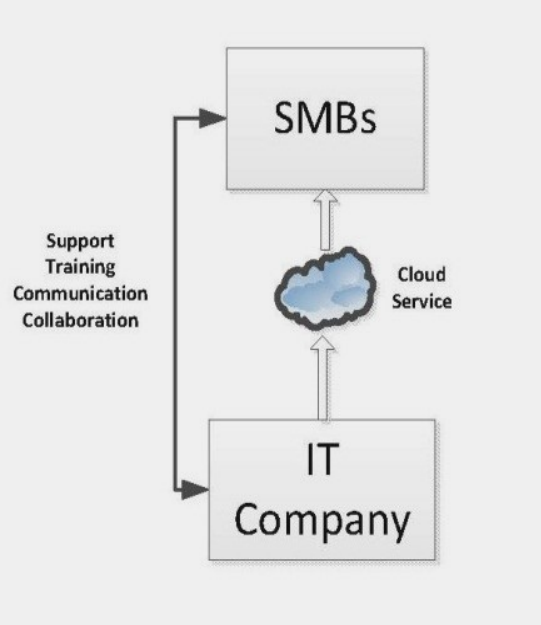
- Consolidated data centers:
  - Can invest in latest green technologies which:
    - Reduce power consumption
    - Transmission costs
    - Greenhouse gas emissions

Economic Development
Through Transformational Technology

New York State Cloud Computing and Analytics Center

NYS Cloud Computing and Analytics Center supports the 6 goals identified by the IT Cluster:

- **Foster growth of mid-sized businesses and attract new businesses to the region.**
- **Help small businesses grow by delivering affordable IT services and expertise.**
- **Provide IT services to businesses across all clusters, regions, and market segments.**
- **Offer on-site and virtual incubation and support for start-ups.**
- **Provide workforce development and consulting services**
- **Support IBM and other large companies to assure their continued growth and world leadership.**



Economic Development
Through Transformational Technology

Individual Components

The New York State Cloud Computing and Analytics Center (CCAC) would bring together the following components:

- **Cloud Computing Incubation Center**
- **SMB Cloud**
- **Smarter Business Development Cloud**
- **Workforce Development Cloud**

Benefits of combining these components into one transformative project:

- **Consolidation of resources and personnel**
- **Lower costs to the Center clients**
- **Reduced energy consumption**
- **One-stop IT center for regional and state businesses.**

Economic Development
Through Transformational Technology

NYS Cloud Computing Incubation Center

Work with companies on early-stage projects

Physical and virtual incubation for up to 2 years

Provide access to cutting-edge SW and HW technologies, IT services, and consulting

Utilize the facilities of the Hancock Center

- **Leverage $15M+ of state and federal funding**
- **Leverage $10M+ of IBM support**
- **Access to Cisco Telepresence System**
- **Temporary office space**
- **Administrative support**

Assist with transition to other data centers

Economic Development
Through Transformational Technology

SMB Cloud

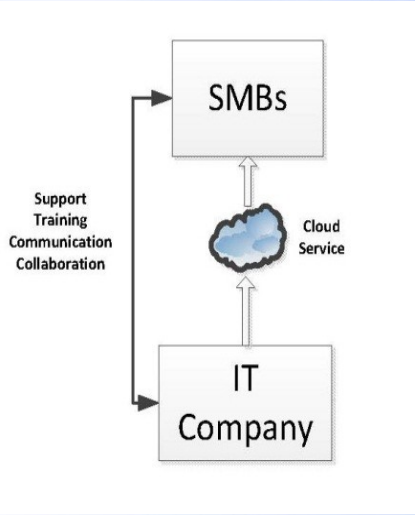
SMB access to suite of open-source back-office software products

- **Manage inventory**
- **Electronic payments**
- **Human resources applications**
- **Customer relationship management**
- **Account Payable**

Menu of collaboration tools for SMB employers, suppliers, and customers

Web services and hosting

Training and consulting



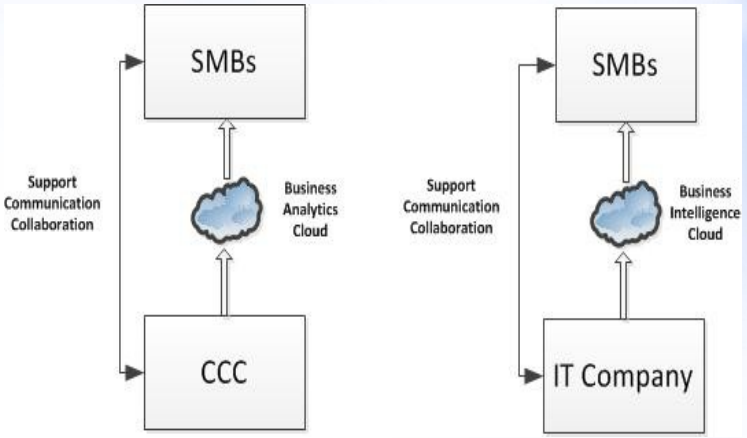
Relieves IT burden - allows SMBs to focus on their core business

Will include women, minority, and veteran-owned businesses

Economic Development
Through Transformational Technology

Smarter Business Development Cloud

- Builds on IBM Smarter Planet Initiative
- Benefits companies of all sizes
- Access to Virtual Computing Laboratory
- Cutting-edge business intelligence and predictive analytics SW and services
- Shared cost of access to expensive tools
- IT companies will provide value-add services
- Provides sustainable jobs for regional college graduates (stops brain drain)



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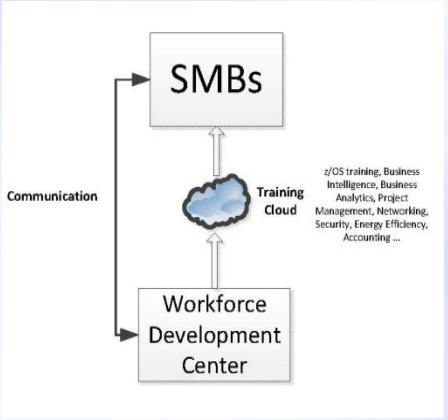
Workforce Development Cloud



Provides critical online education and training

Capitalizes on existing resources:

- **Institute for Data Center Professionals**
- **z/OS Knowledge Center**
- **Virtual Computing Laboratory**

Builds on existing programs:

- **Business Intelligence, z/OS Training, Network & Security Technologies**
- **Project Management, Business Management, Accounting**
- **Energy Efficiency, Others…**

Deploy new courses in response to critical skill needs

Deploy courses developed by partners

Roll out statewide through D.O.L. One-Stop Centers

Tuition subsidies based on income and employment status

Economic Development Through Transformational Technology