



**Aristos**  
*Improving Patient Care*

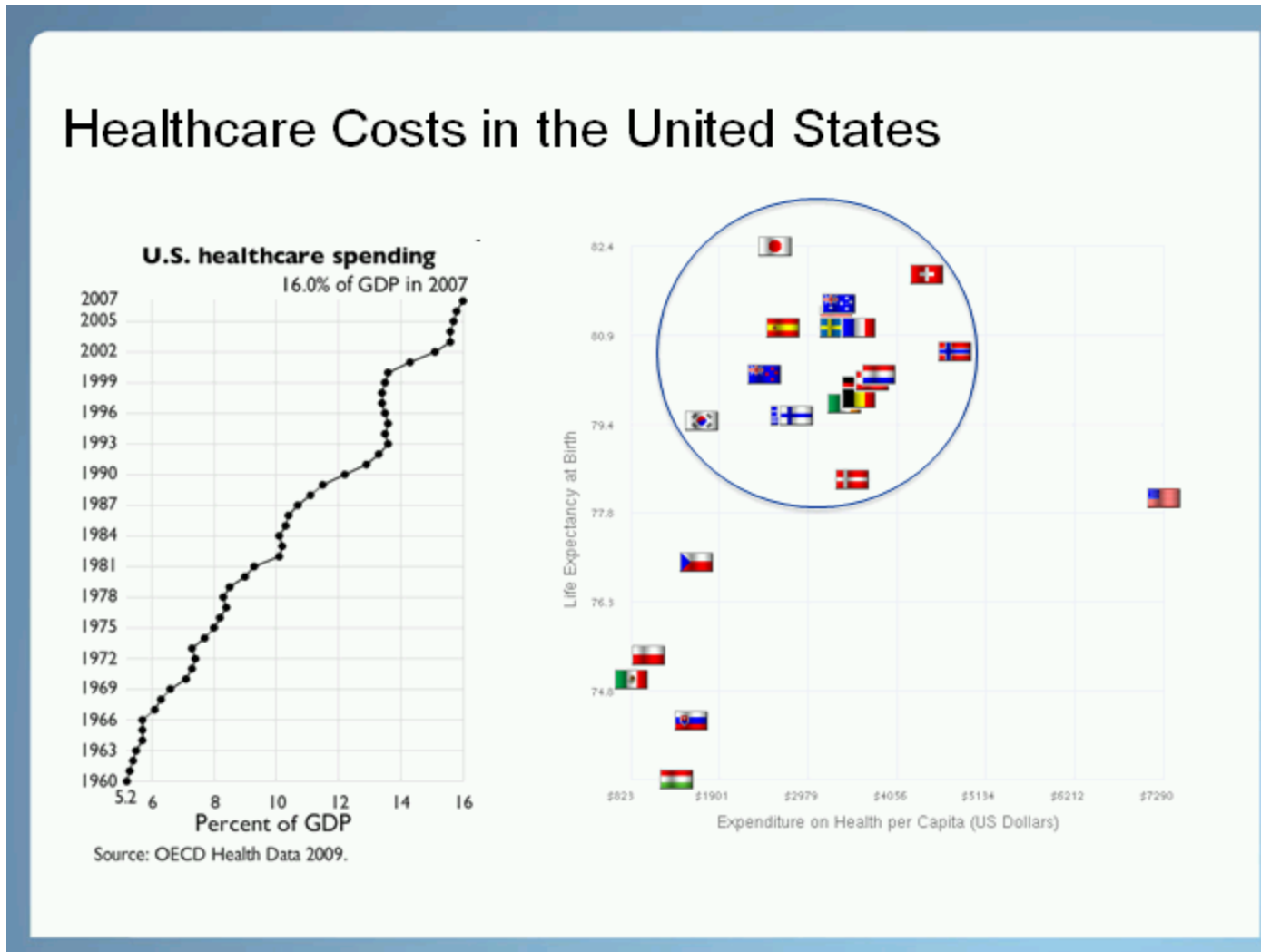
## The Meaning of Meaningful Use and Security on the Cloud.

**Allan Fabrick**  
Chief Technology Officer  
Aristos

Microsoft  
**SQL Azure**

The Meaning of Meaningful Use and Security on the Cloud.

## Healthcare Costs in the United States



Healthcare Costs in the United States

## Meaningful Use of Medical Information

The American Recovery and Reinvestment Act of 2009 specifies three main components of Meaningful Use:

1. The use of a certified EHR in a meaningful manner, such as e-prescribing.
2. The use of certified EHR technology for electronic exchange of health information to improve quality of health care.
3. The use of certified EHR technology to submit clinical quality and other measures.

**Aristos**  
Improving Patient Care

Meaningful Use of Medical Information

## Saving from the Meaningful Use of Medical Information

- e-Prescribing  
potential savings of \$3.5 Billion/year
- Electronic exchange of patient health information  
potential saving unknown
- Clinical quality and other measures  
potential saving of \$100+ Billion/year

**Aristos**  
Improving Patient Care

Saving from the Meaningful Use of Medical Information

## Three pivotal strategies for improving quality in the ambulatory setting

Decision-support tools and resources—but the gains here tend to be modest: on the order of 10% to 15% improvement per measure

Registry-based tools—you have to be able to list your patients and determine who is in or out of compliance with the treatment plan, with some method of contacting them, and this should not depend on the physician

Team component, including support for outreach to patients who are not coming in as scheduled or who are not in compliance.

*“It’s clear that if you create an environment with the right strategies and tools and the right incentives, you can improve care across a broad range of parameters.”*

**Aristos**  
Improving Patient Care

Three pivotal strategies for improving quality in the ambulatory setting

## Patient Electronic Care System

PECSYS generalized registry developed for the Bureau of Primary Health Care's Health Disparities Collaboratives.

Facilities health care improvement

- Chronic care model (MacColl Institute for Healthcare Innovation)
- Improvement model (Associates in Process Improvement)
- Change model (Institute for Healthcare Improvement)

Used by community health organizations, ambulatory clinics and prisons to measure and improve health care

Delivered with 200+ best practice guidelines

Delivered with 200+ reports for all major chronic diseases and prevention

All reports feature drill down to patient lists and then to individual patient data

**Aristos**  
Improving Patient Care

Patient Electronic Care System

## Results

### CareSouth Carolina Community Health

	CareSouth Carolina	Other community providers	Specialists
% Hospitalizations	2.08%	7.69%	9.52%
Average cost per hospitalization	\$3,546	\$10,894	\$12,025
Average office visit reimbursement	\$67.42	\$65.52	\$67.35
<b>Average total cost per patient, per year</b>	<b>\$343</b>	<b>\$1,591</b>	<b>\$1,883</b>

### Community Health Network, Outpatient Care Program University of Texas Medical Branch

50% cost reduction in inpatient hospital encounters

62% cost reduction in acute outpatient encounters

143% cost increase in outpatient clinic encounters

50% of patients seen by primary care provider in last 6 months

**Aristos**  
Improving Patient Care

## Results

## PECSYS Reports

### Population Summary Reports

Drill down from measures to list of patients who are out of compliance

- Diabetes
- Cardiovascular
- Chronic Kidney Disease
- Depression
- Asthma EPR3
- Cancer Prevention
- Prevention
- Meaningful Use
- Rural Health
- UDS Table 6b
- UDS Table 7

### Reminder Matrix

- 200+ best practice measures
- Drill down to list of patients who are out of compliance

### Reliability Index Report

- List patients meeting all measures
- Drill down to list of patients who are out of compliance for individual measures.

### Spreadsheet Reports

- 200+ reports listing patients who are, or will soon be, out of compliance
- Drill down to individual patient data

**Aristos**  
Improving Patient Care

## PECSYS Reports

"...you have to be able to list your patients and determine who is in or out of compliance"

PECSYS - DM Registry Summary Report - AJFDELL670WPECSSQL.Large\_Anonymous.sa

3.7.243-04060 **Diabetes Registry Summary Report** From 1/1/2007 Thru 12/31/2007

All Clinics and Providers

**1. Patients**

2523	0.15%
2214	87.8%
300	11.9%
9	0.4%
0	0.0%

**2. Sex**

1645	65.2%
867	34.4%
0	0.0%
11	0.4%

**3. Age**

0	0.0%
1	0.0%
69	2.7%
634	25.1%
1084	43.0%
735	29.1%
0	0.0%
2453	97.2%
2250	89.2%
1480	58.7%

**4. Race**

644	25.5%
716	28.4%
2	0.1%
3	0.1%
1051	41.7%
3	0.1%
60	2.4%
44	1.7%

**6. Insurance**

2381	94.4%
119	5.0%
743	31.2%
517	21.7%
119	5.0%
29	1.2%
0	0.0%
2	0.1%
0	0.0%
512	21.5%
340	14.3%

**6. Type of diabetes**

174	6.9%
2356	93.4%

**9. Blood Pressure**

281	11.1%
136	7.7%
197	7.9%
129	4.9%
<b>84</b>	<b>29.9%</b>

**10. Medication**

911	36.1%
1029	40.8%
1121	44.4%
602	23.9%
51	2.0%
1009	40.0%
238	9.4%
1172	46.5%
453	18.0%
347	13.8%
64	2.5%
140	5.5%
506	20.1%
1009	40.0%
878	34.8%
668	26.5%
<b>987</b>	<b>42.5%</b>
<b>760</b>	<b>51.4%</b>
<b>432</b>	<b>19.2%</b>
1156	54.7%

**11. Health Pro**

1657	65.7%
1050	41.6%
68	2.7%
1	0.0%
259	10.3%
156	6.2%
91	3.6%
146	5.8%
220	8.7%
303	12.0%
12	0.5%
2	0.1%
7	3.0%
1	0.0%
7	3.0%

**12. Specialty C**

1133	44.9%
0	0.0%
1252	49.6%

**13. HbA1c or Glucosylates Hb**

15	0.6%
<b>9.1</b>	<b>15</b>
3	20.0%
2	13.3%
2	13.3%

**9e. Patients BP < 130/80**

Chart #	Last	First	Clinic	PCP	Last Encounter Date	Systolic BF	Diastolic BI
c10002	LAS010018	FIR010019	Clinic_4	PCP0100...	1/11/2007	134	66
c10004	LAS010052	FIR010053	Clinic_4	PCP0100...	1/4/2007	174	96
c12920	LAS055967	FIR055968	Clinic_13	PCP0000...	1/5/2007	134	82
c12948	LAS066475	FIR066476	Clinic_13	PCP0100...	1/10/2007	128	88
c13005	LAS057369	FIR057370	Clinic_13	PCP0100...	1/13/2007	130	80
c13058	LAS058249	FIR058250	Clinic_13	PCP0100...	1/17/2007	140	100
c13060	LAS058284	FIR058285	Clinic_13	PCP0100...	1/30/2007	120	80
c13081	LAS058687	FIR058688	Clinic_13	PCP0100...	1/16/2007	148	88
c13117	LAS065696	FIR059299	Clinic_13	PCP0100...	1/20/2007	168	66
c13345	LAS063384	FIR063385	Clinic_13	PCP0100...	1/9/2007	120	90
c13462	LAS065235	FIR065236	Clinic_13	PCP0100...	1/2/2007	198	88
c13524	LAS066218	FIR066219	Clinic_13	PCP0100...	1/16/2007	130	70
c13529	LAS066342	FIR066343	Clinic_1	PCP0100...	1/11/2007	190	70
c13551	LAS066695	FIR066696	Clinic_13	PCP0100...	1/17/2007	132	88
c13559	LAS066849	FIR066850	Clinic_13	PCP0100...	1/24/2007	120	84
c13625	LAS067627	FIR067628	Clinic_13	PCP0100...	1/31/2007	130	70
c13676	LAS068281	FIR068282	Clinic_13	PCP0000...	1/20/2007	142	60
c13743	LAS069154	FIR069155	CP Med C...	PCP0100...	1/3/2007	120	80
c13758	LAS069415	FIR069416	CP Med C...	PCP0100...	1/4/2007	174	100
c13771	LAS069662	FIR069663	CP Med C...	PCP0100...	1/4/2007	150	70
c13775	LAS069736	FIR069737	CP Med C...	PCP0100...	1/2/2007	170	80
c13794	LAS070084	FIR070085	CP Med C...	PCP0100...	1/6/2007	160	76
c13799	LAS070178	FIR070179	CP Med C...	PCP0100...	1/3/2007	158	80
c13839	LAS070911	FIR070912	CP Med C...	PCP0100...	1/3/2007	140	70
c13847	LAS071064	FIR071065	CP Med C...	PCP0100...	1/3/2007	152	92
c13849	LAS071087	FIR071088	CP Med C...	PCP0100...	1/4/2007	184	84

197 row

Measure Definition  
Copy To Clipboard

Included  
 Excluded

"...you have to be able to list your patients and determine who is in or out of compliance"

PECSYS - Data Entry - AJFDELL 670VPCSSQL - Large - Anonymous - sa

Encounter: 1 | Charts | Flow Sheet | Reminders | Clinical Tracker | Custom View | Documents | Close

**Encounter Note** | Encounter Date: 6/22/07 | Provider: M Ralston (Inactive) | Office Visit

Chart #: 101Complex | Last Name: | First Name: | Very | Age: 72 | DOB: 6/8/35 | Sex: Female

Vitals: Last Visit 5/18/07 | Weight: 200.2 | 203.6 | Height: 5'3.0" | Pulse: | Resp Rate: | Temp: | Office PEFR: | Waist Circ In: | AsthmaACT: | BetaAgon\_Week: |

Class	Name	Date	D/C	C1	Dec
Diuretic	Glass	11/1/04			
Other BP Meds	Glass	4/13/07			
Antiplatelet/ASA	Glass	8/15/03			
Statins	Glass	8/15/03			
SSRIs	Glass	3/19/06			

Test	Value	Date	PRef	RefDec
2UGProtein	75	2/24/06		
Potassium	5	4/20/07		
Creat	1.1	4/13/07		
FSH	1.38	4/13/07		
AST	14	4/13/07		
ALT	8	4/13/07		

Behaviors	Status
Substance Abuse	
Tobacco/TS	
Current/Prev/never/Yes/No/Unknown	

Test	Value	Date	PRef	RefDec
LEAP Risk	1	8/11/06		
Exercise wk	0	4/7/06		
LVEF				

Cons Edu	Date	PRef	RefDec
Pt Mamma Exm	7/10/04		
Pt Pap Results	11/20/99		
Wt Mat Plan			
Dental Exam	12/14/04		
PtP Dental Cnd			
Advice Quit Tob	11/14/03		
Hospital			
SM Oral Bat	6/13/05		

**Diagnosed Conditions**

Dx	Date	D/R
DM Type 2	6/15/03	
Retinopathy	6/15/03	
Nephropathy	6/15/03	
Neuropathy	6/15/03	
Hypertension	6/15/03	
Dyslipidemia	6/15/03	
CAD	4/20/07	
Cerebro Vasc Dz	6/15/03	
PAD	6/15/03	
Depression MDD	11/12/04	
Asthma	3/19/06	

**Potential Conditions**

Add	Class	Name	Date	D/C	C1	Dec
	Leukot Inhib	Glass				
	MC Stabilizer	Glass				
	SA_BetaAg	Glass				
	Nutritional Supplem					

**Contraindicated Medications**

Add	Dec	Class	Name	Date	D/C	C1	Dec
		BB & Diuretic	Glass	5/11/07			
		ACE Inhibitor	Glass	9/8/06			

**Discontinued Medications**

Add	Dec	Class	Name	Date	D/C	C1	Dec
		Bismimides	Glucophage	12/10/04			

**Laboratory Test Results**

Test	Value	Date	PRef	RefDec
HbA1c	10.6	4/13/07		
Chol	205	4/20/07		
LDL	116	4/20/07		
HDL	66	4/20/07		
Tglyc	114	4/20/07		

**Risk Factors**

General	Status
FaFH/DI	yes
FaFH/Depres	yes
FaFH/Phys Abuse	
FaFH/Stroke	

**Behaviors**

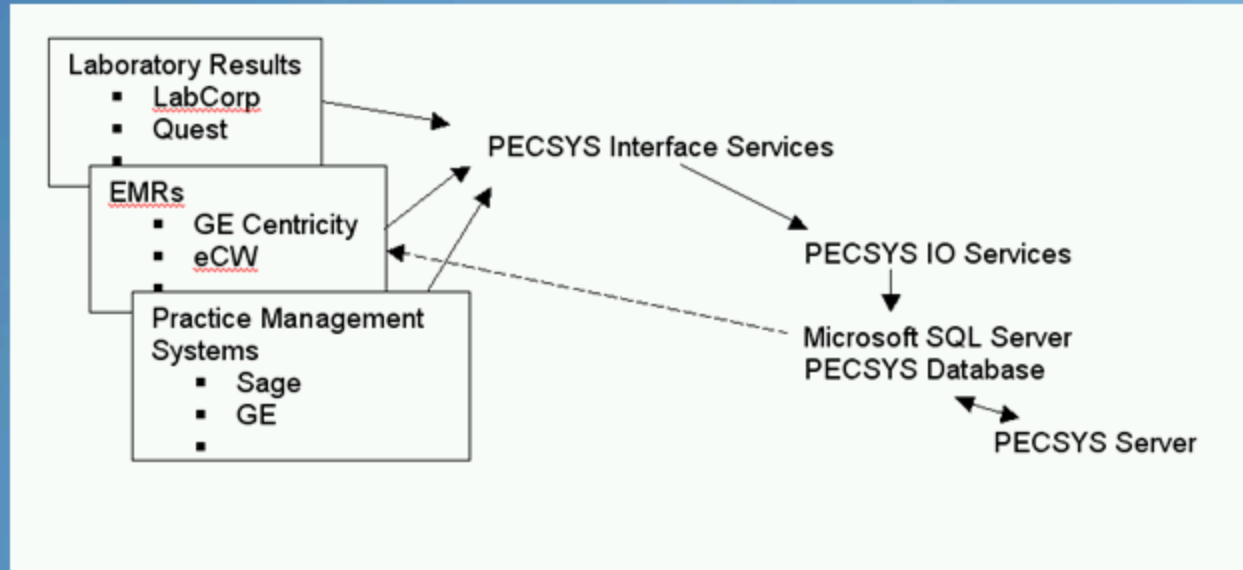
Behaviors	Status
SM BD	current
Daily Weighing	

**Reminders**

Reminder	Count
Colon Cancer Screening in Due	1
Pap Smear in Due	1
Mammogram Results Not Given to Patient	1
No Self Management Goal Set in 1 year	1
FoBT Selected at Colon CX Screen	2
Asthma - 6C No Symptom Free Days Last Visit	3
Lipids Lipid Panel not done in past 1 year	3
TestChest	5

Slide 10

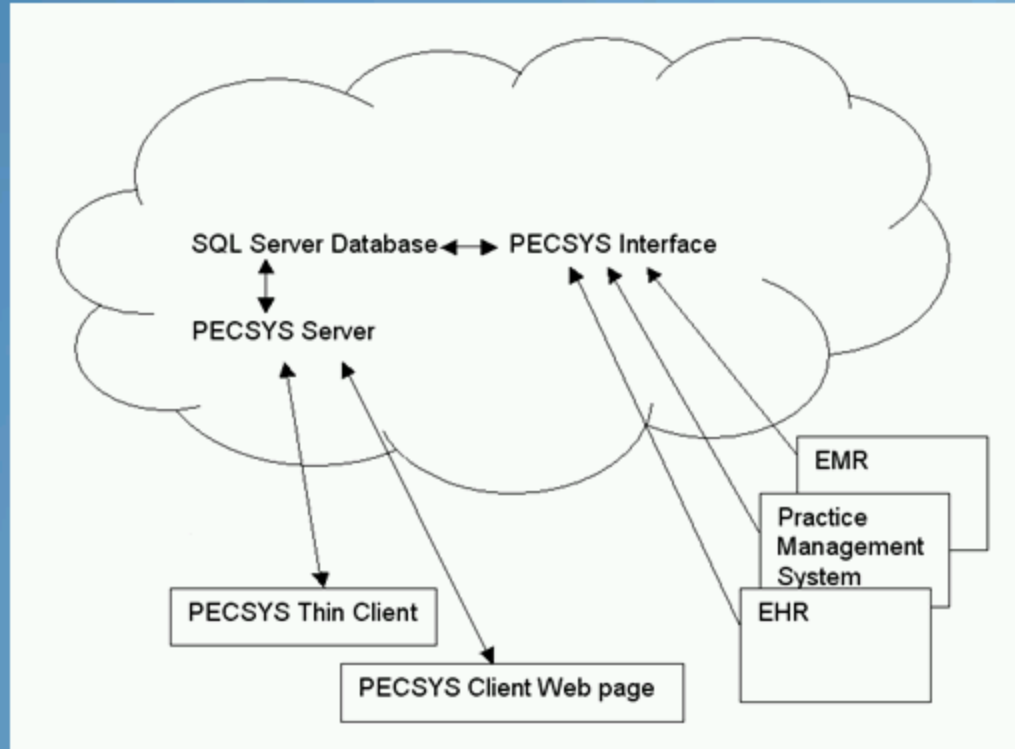
## Exchanging Healthcare Information



Exchanging Healthcare Information

# Migration to the Cloud

## PECSYS as a service



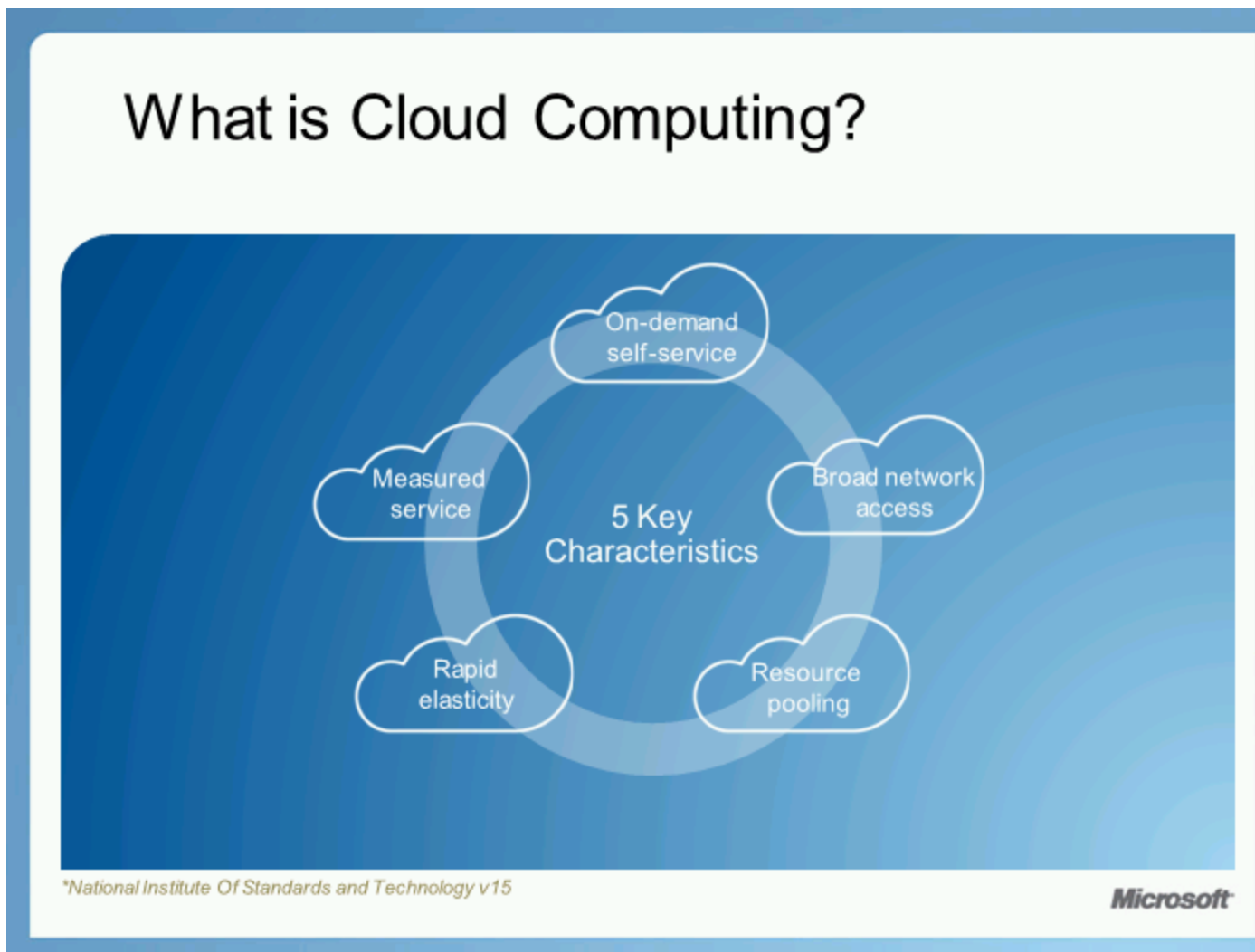
**Aristos**  
Improving Patient Care

Migration to the Cloud



Cloud Computing in Health

# What is Cloud Computing?



What is Cloud Computing?

## How Can the Cloud Help You?

- Better Cost Control
- Agility, Flexibility & Scale
- Focus resources on healthcare, not IT
- Unprecedented Collaboration, including deskless workers and mobile phones
- Enterprise class IT for small health organizations

*Microsoft*

How Can the Cloud Help You?

## Why does the Cloud Matter to Covered Entities?

### Cloud Computing Value Proposition

#### Reason 1: Reduce Infrastructure Costs by Factors of 5 to 7\*

Economies of scale in 2006 for medium-sized datacenter (1000 servers) vs. very large datacenter (50,000 servers).

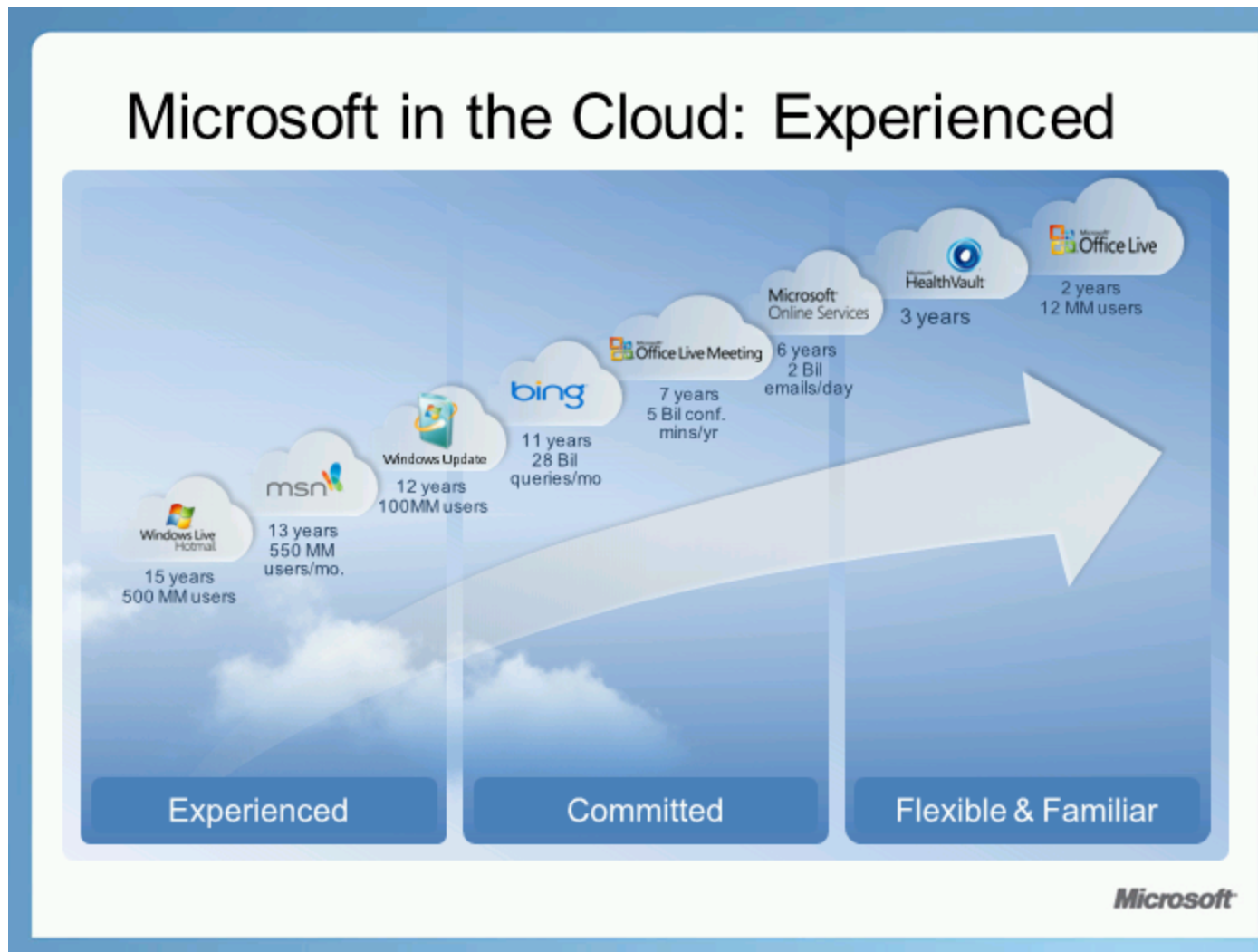
Technology	Cost in Medium-sized DC	Cost in Very Large DC	Ratio
Network	\$95 per Mbit/sec/month	\$13 per Mbit/sec/month	7.1
Storage	\$2.20 per GByte / month	\$0.40 per GByte / month	5.7
Administration	≈140 Servers / Administrator	>1000 Servers / Administrator	7.1

86%  
Savings!

\*"Above the Clouds: A Berkeley View of Cloud Computing", Electrical Engineering and Computer Sciences University of California at Berkeley, Technical Report No. UCB/EECS-2009-28, <http://www.eecs.berkeley.edu/Pubs/TechRpts/2009/EECS-2009-28.html>

Microsoft

Why does the Cloud Matter to Covered Entities?



Microsoft in the Cloud: Experienced

## But, What are Organizations Saying?

### Research Summary: Covered Entities View of the Cloud

- While many covered entities rely on hosted solutions today, the idea of moving to the cloud still concerns them
  - To communicate effectively in this context, need to keep cloud-related concerns in mind

- 1. Keeping data secure**

*"I can't have patient data on outside servers."*

- 2. Losing control**

*"Even if Microsoft is running it I'm still on the hook."*

- 3. Compliance issues**

*"Our lawyers would never allow it."*

- 4. Reliability/Inadequate support**

*"They won't be on call the way our current mail vendor is."*

But, What are Organizations Saying? Research Summary: Covered Entities View of the Cloud

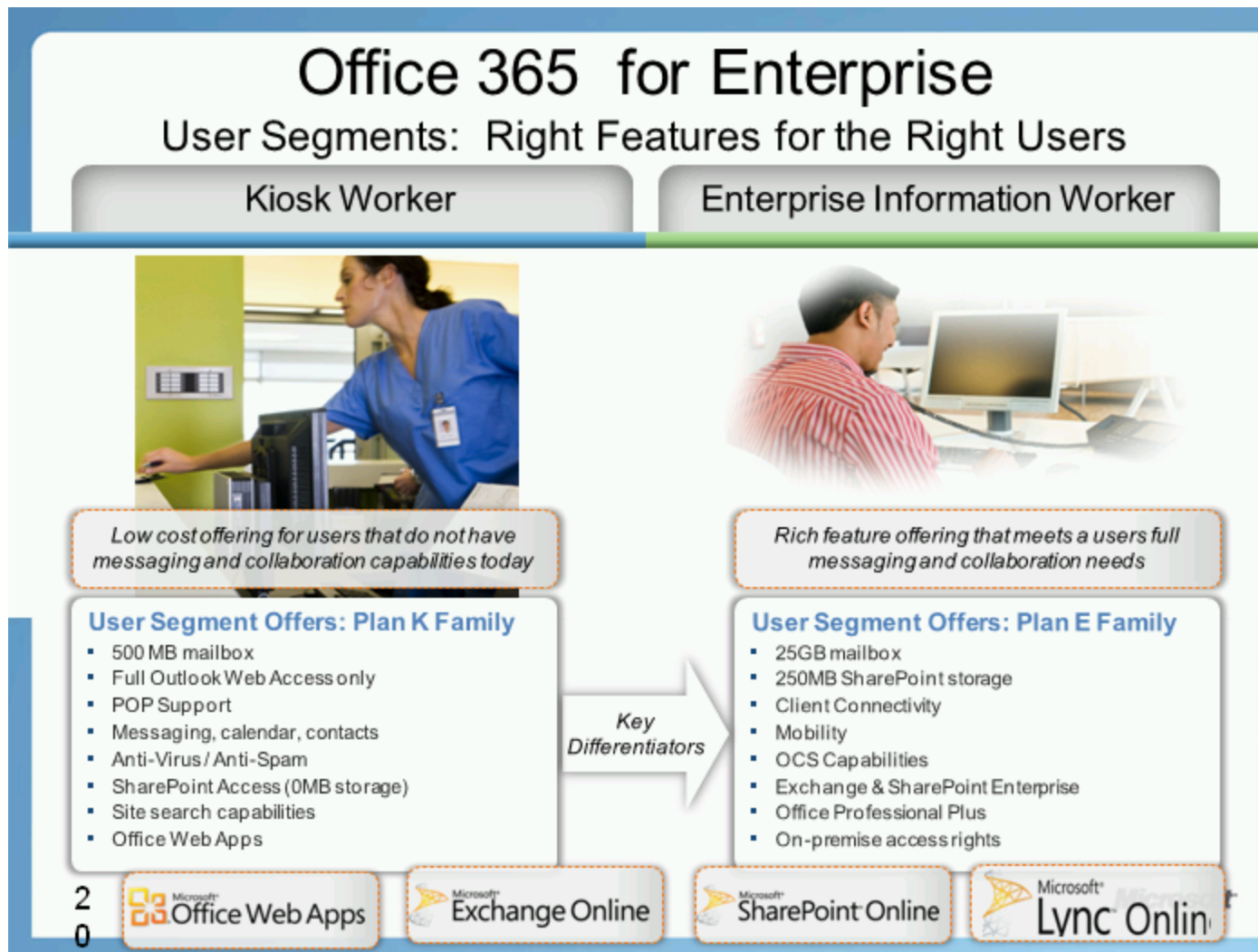
## What are Health and Government Organizations Really Doing? Some recent examples...

- ✓ 43,000+ Health Plan Users on Office 365 (BPOS-D)
- ✓ 168,000+ Gov't Users on Office 365 (BPOS-D)
- ✓ Millions of Plan Based Health Records linked to cloud services – (member must opt in)
- ✓ 1 Million military users given access to online health record store
- ✓ Cloud based infrastructure piloted to distribute mobile apps and non-PHI data such as provider information
- ✓ Cloud based health literacy and marketing kiosks

19

Microsoft

What are Health and Government Organizations Really Doing? Some recent examples...



Office 365 for Enterprise User Segments: Right Features for the Right Users

 **EMORY UNIVERSITY** **h1n1 swine flu Response Center**  
Brought to you by Microsoft®

**THEIR VISION**  
Create a scalable Web site where people can receive info about flu and guidance based on self-assessment

**Achieving Health & Wellness**  
The web site needed to be able to handle **big spikes in traffic**. When the media broke a story about the virus, it caused **dramatic increases in site visits**. The same would happen in response to other trigger events, such as school closings. But, the most important time for the service to be available was during those bursts, so a **platform solution was needed** that could scale seamlessly.

**Solutions**  
 **Windows Azure™**

**In Their Words**  
"It is going to be essential that we use every tool and service at our disposal to contain this illness, and online H1N1 self-assessment tools, such as the one offered by Microsoft, can be helpful in providing people with ways to determine whether they should seek emergency care."

Physicians Angela Gardner, M.D., F.A.C.E.P., president of the American College of Emergency

**Microsoft**

Slide 21



**NewYork-Presbyterian**  
The University Hospital of Columbia and Cornell

**THEIR VISION**  
Create a complete end to end solution for  
empowering patients and their care team



**Achieving Health & Wellness**

Through the development of a **centralized Continuity of Care Record** for each patient across their system and the ability for **the patient to access that record** through MYNYP.org, New York-Presbyterian provided a new depth of information to clinicians and patients—empowering every member of the team to make decisions and take action with more insight, intelligence, and confidence.

**Solutions**



**In Their Words**

“With the connection of Amalga, which aggregates data across the New York-Presbyterian enterprise, and HealthVault, which allows patients to aggregate and share their data across the healthcare ecosystem, Microsoft has provided a unique opportunity for us to put our patients first and to empower them to manage their healthcare.”

Aurelia Boyer RN, Chief Information Officer, New York-Presbyterian



Slide 22



*Questions???*

*Microsoft*

Slide 24