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WebOps Summit

Monitoring Website Performance:
Behind the Scenes in Keynote Operations

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Monitoring Website Performance: Behind the Scenes in Keynote Operations



In the Eye of the Storm

**Being in the calm of a storm
means there is more to come...**

In the Eye of the Storm



In the Eye of the Storm—WebOps

WebOperations is not merely an organizational blend of web technologies and business objectives and metrics into traditional Operations departments (i.e. network, server, application management).

It requires a complete mind shift from an “inward-out” mentality to one focusing on customers and how they impact the overall business, thus creating an “outward-in” view of Operations.

The Evolution of Operations @ Keynote

1996

- **First website performance/availability monitoring service**
 - 10 Website measurement servers United States
 - 2 Application servers handling client/server communications
 - 1 Database server
- **Little consideration given to “Performance”**
 - Client/Server software solution (not within a browser)
 - Written in “Oak” (later renamed Java) and released with JDK 1.0
- **Little relationship with Marketing and Business Management**
 - Classic NetOps, SysAdmin, DBA, and Developer silos...
 - “Just make it work!”

The Evolution of Operations @ Keynote

1997

- **Moved from a software focus to pioneering the SaaS market**
 - “Web Edition” (later renamed to “MyKeynote”) introduced
 - Move functionality into the browser
 - Measurement network grew by 200% (that’s only 30 servers)
 - Introduce Europe and Asia measurement locations
 - Operations remained relatively unchanged in structure
 - Customer performance understanding beginning to emerge

The Evolution of Operations @ Keynote

1998—1999

- **Growth & Expansion**

- Grew infrastructure to >1,000 measurement in 50 cities worldwide
- Backend re-architecture implemented
 - Failover/Load distribution appliances
 - Diversified database architecture
 - More bandwidth acquired (3x T3s from 1x T1) with BGP (AS 12103)
 - Standardization

- **Understanding the End-User**

- Formalized relationships with “Operations” and “Customer Service”
 - *Network Operations, External Production Systems, & Customer Support* organizations brought into a single department
- Introduce customer & business objectives to complement Operational objectives (i.e. data quality)

The Evolution of Operations @ Keynote

2000—2003



The Evolution of Operations @ Keynote

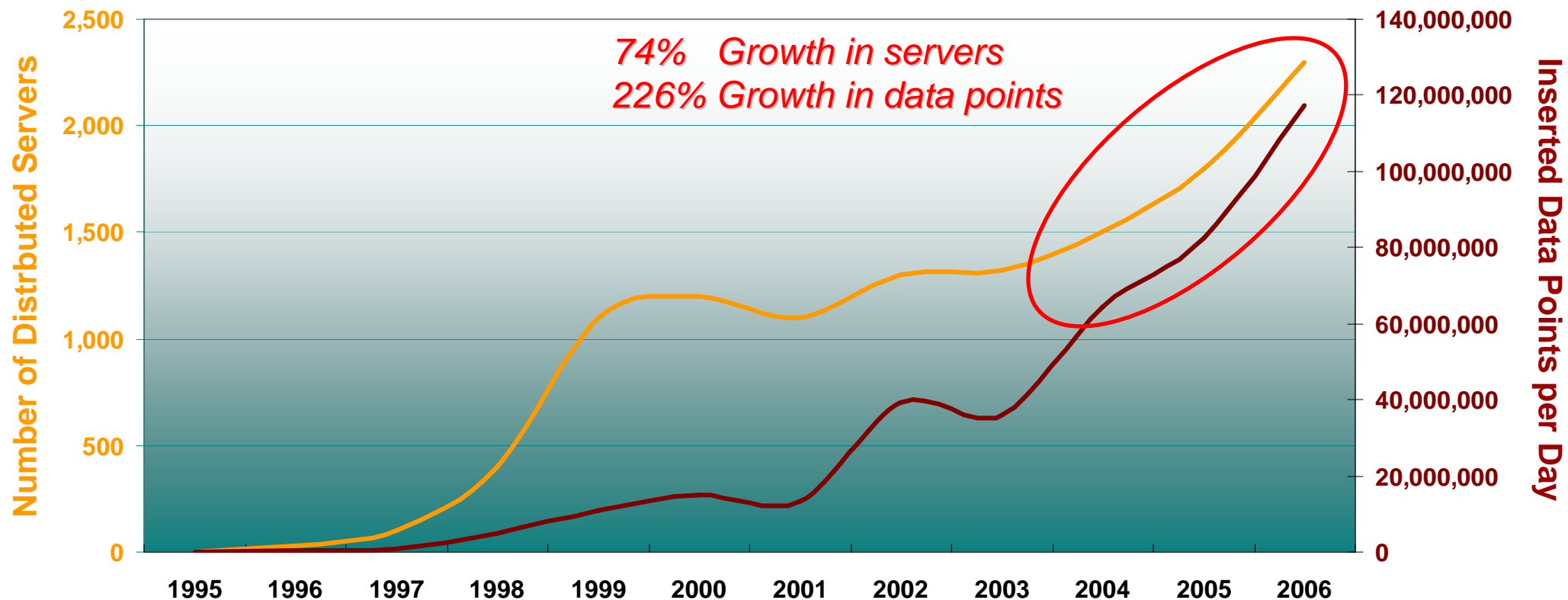
2004—Present

- **Introduce next-gen solutions for emerging technologies**
 - Web 2.0 (AJAX, Flash, etc.)
 - VoIP & Streaming
 - Mobile
 - Last Mile and Broadband
 - Load Testing (Streaming, Mobile, etc.)
- **Significant expansion & complexities**
 - VoIP ATAs, mobile devices, etc.
 - Consumer-based connectivity (DSL, Cable broadband, EVDO, etc.)
- **New challenges with limited resources**
 - “Do more with less...”

The Evolution of Operations @ Keynote

2004—Present

- Number of servers vs. measurement data points collected/inserted per day



Keynote Today

- Global Distribution of Measurement Locations

Region	Locations	Cities	Countries	Carriers
North America	151	106	3	23
Europe	57	29	22	48
Asia-Pacific	29	19	13	33
Middle East & Africa	4	4	4	10
South America	2	2	2	2
Totals	243	160	44	116

Keynote Today



Keynote Today

North American Offices

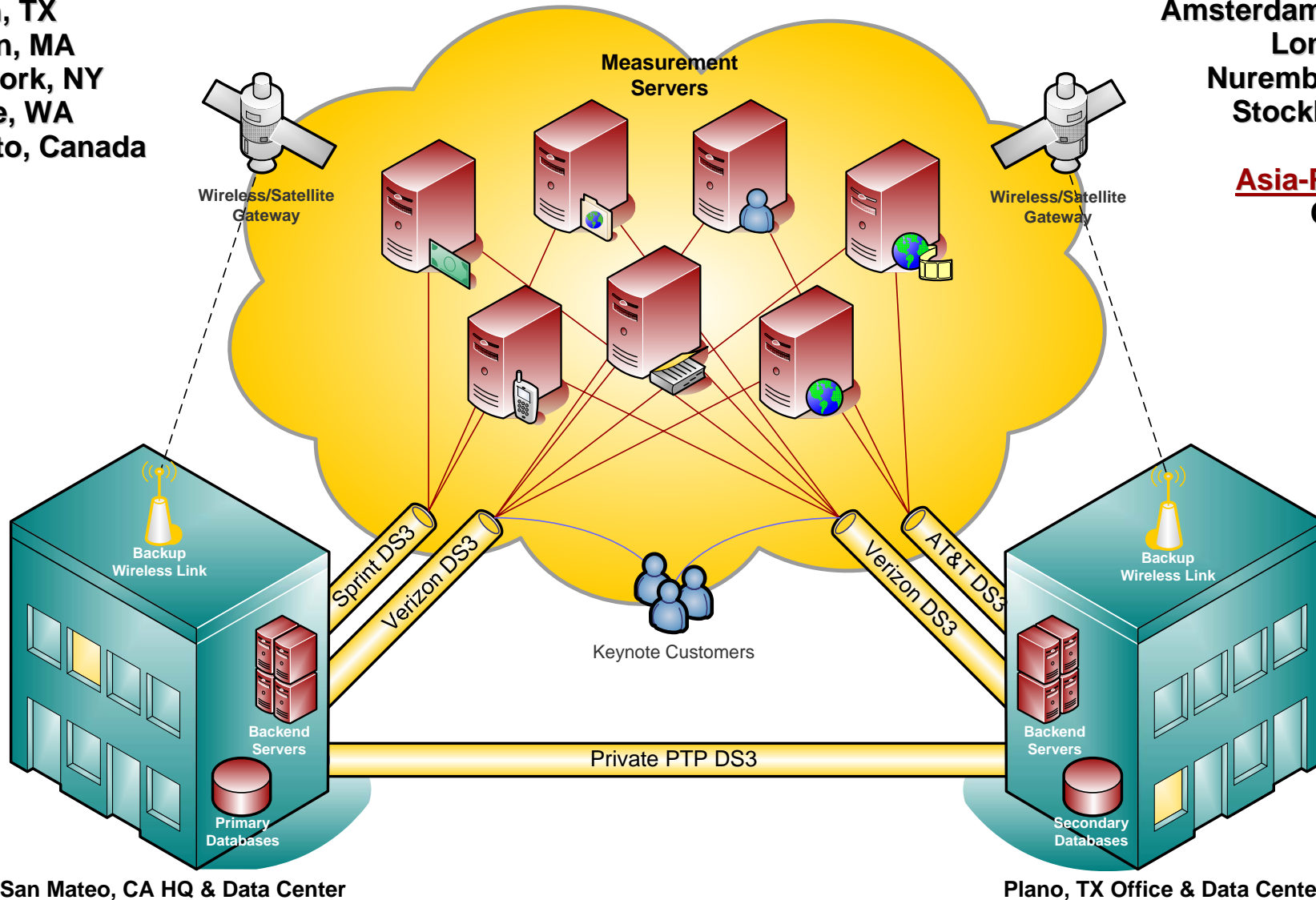
Austin, TX
Boston, MA
New York, NY
Seattle, WA
Toronto, Canada

European Offices

Amsterdam, Netherlands
London, England
Nuremburg, Germany
Stockholm, Sweden

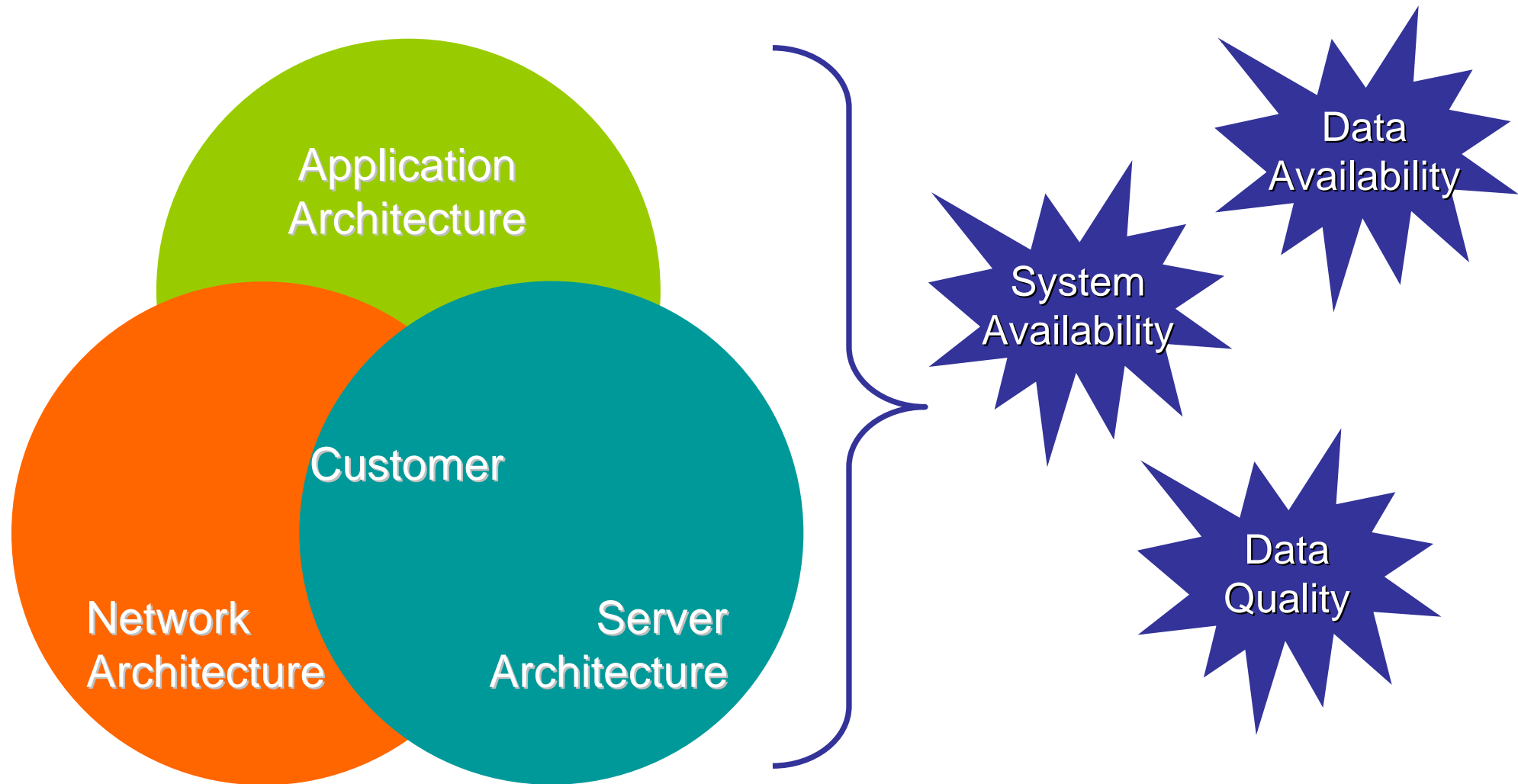
Asia-Pacific Offices

Chennai, India



Keeping It All Under Control

- **Keynote's Internal Monitoring Methodology**



Keeping It All Under Control

Best Practice: Standardization

- **Meta Group published a study[†] that found:**
 - The average IT server-to-SysAdmin ratio: 10:1 to 20:1
 - Service levels affected at >30:1
 - A strong case can be made to hire more staff
 - In a few examples, they found ratios greater than 50:1
- **Keynote's ratio of servers to SysAdmins is ~132:1**
 - Ratio not consistent across organization
 - Ranges between 35:1 to 150:1 depending upon internal organization
 - Primarily possible through Standardization
 - May not be realistic nor advantageous for all organizations
 - However, the concept itself is especially important for WebOps organization!!!

[†] *The Bell Curve: Server-to-System Administrator Ratios, Meta Group, January 2002*

Shawn's Top Ten List for Standardization

Hardware
Operating Systems
Application & Development Platforms
Change Management
Documentation
Policies & Procedures
Expectations
Vendors
Communications (Internal & External)
Personnel (Training/Knowledge)

“Failure to plan...is planning to fail”

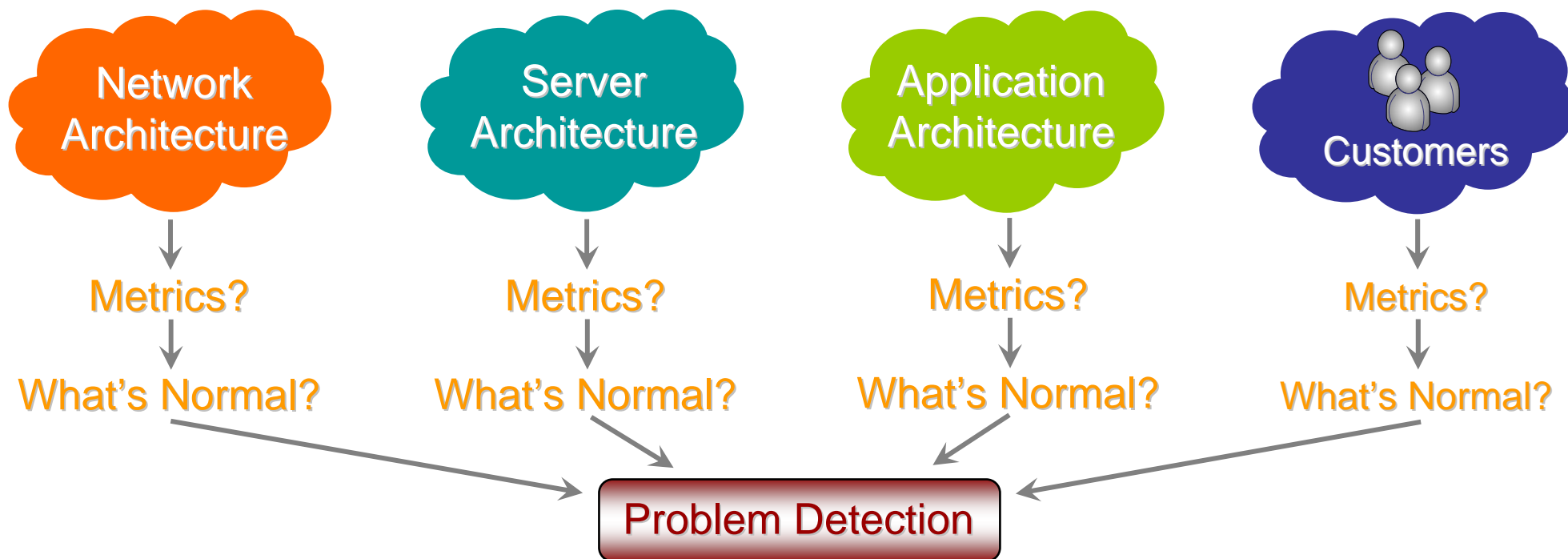
- **Understand your business objectives**
 - Marketing? Sales? Line of Business? Customer Satisfaction?
- **Build a management framework of your infrastructure**
 - Integrate your business objectives and place front-n-center!
- **Ask the How, Who, What, and Why questions**
 - *How* do I measure and/or monitor this business objective?
 - Real browser vs. browser emulation measurements?
 - User Experience (UX) user interception vs. panels?
 - Clickstream/Proxy vs web log analysis?
 - *Who* will react? *Who* is impacted? *Who* is responsible?

“Failure to plan...is planning to fail”

- **Ask the How, Who, What, and Why questions (con't)**
 - *What* are my objectives here? *What* am I trying to accomplish?
 - Am I keeping my vendor's accountable?
 - Am I wanting to stay ahead of my competition?
 - *Why* is this necessary?
 - Will this be actionable or informational?
- **Establish what is “normal”**
 - Create a baseline
 - Account for normal fluctuations (time of day, season, etc.)
 - Between one to four weeks (depending up objective & organization)

Keeping It All Under Control

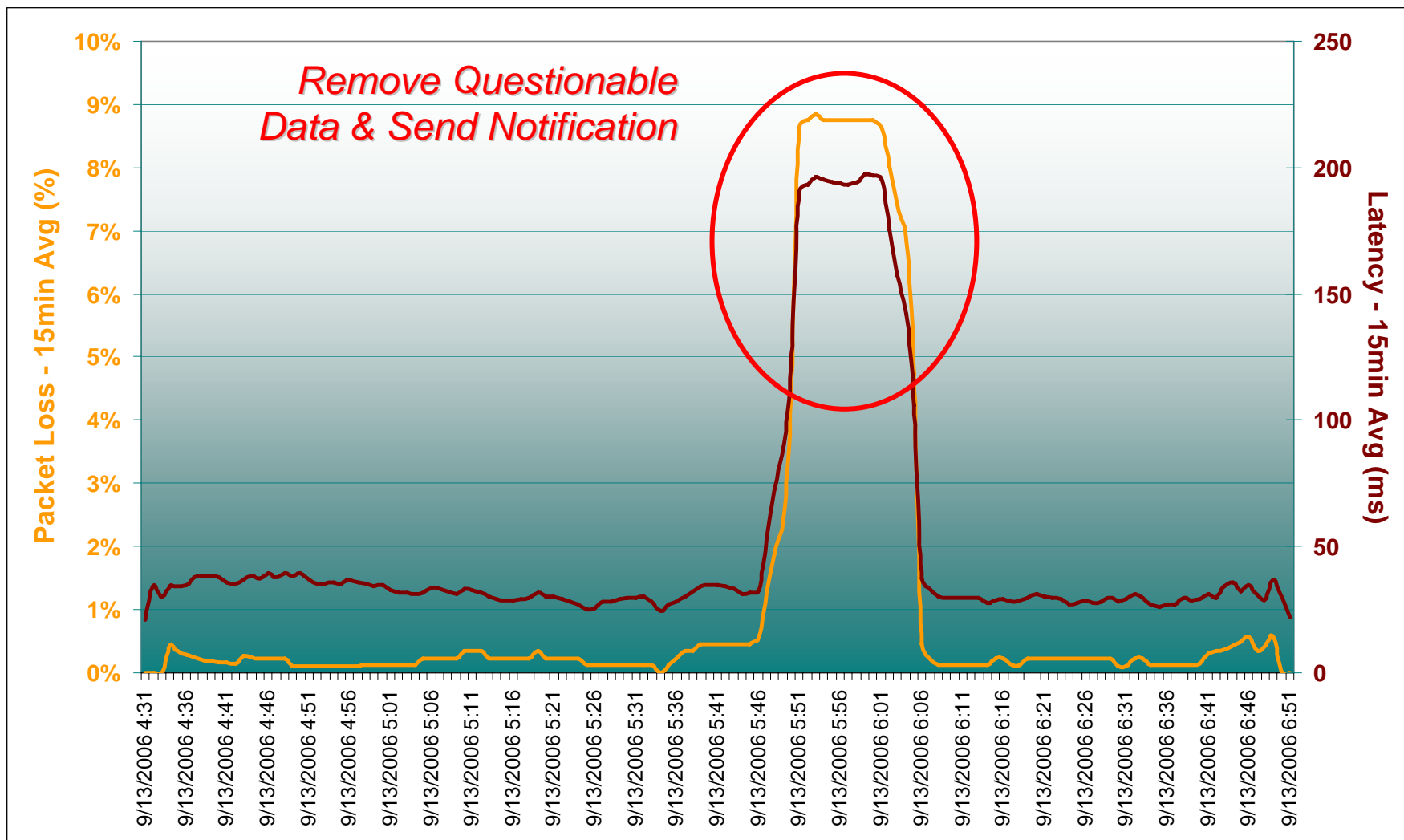
Best Practice: **Measuring & Monitoring**



Keeping It All Under Control

Best Practice: **Measuring & Monitoring**

Network Infrastructure Monitor (NIM): Johannesburg IS



Keeping It All Under Control

Best Practice: Triage/Problem Resolution

Rule #1: The customer is always right

Rule #2: If the customer is wrong...refer to Rule #1

- **The frontline must understand Customer/Business impact**
- **Customer/Business impact should dictate:**
 - Priority
 - Resources
 - Management Involvement 😊
- **Keep it simple for your Operators**
 - Have a central event console (i.e. EMS)
 - Automated actions
 - To gather more information
 - Resolve simple problems
 - Context-sensitive links to external consoles for diagnostics

Keeping It All Under Control

Best Practice: Triage/Problem Resolution

Rule #1: The customer is always right

Rule #2: If the customer is wrong...refer to Rule #1

- **Communication, Communication, Communication**
 - Keep your customers (internal and external) informed
 - During *and* after the problem has been resolved
 - No one's ever been fired for over-communicating...
- **Recovering from False Positives**
 - Re-evaluate/assess what is normal
 - Understand what has changed and why
 - Implement automated actions to check and prevent false positives
- **Make Post-Mortems the Norm...**
 - Those involved: take notes of their observations, investigations, etc.
 - Management: note what worked...what didn't

Keeping It All Under Control

Best Practice: Triage/Problem Resolution

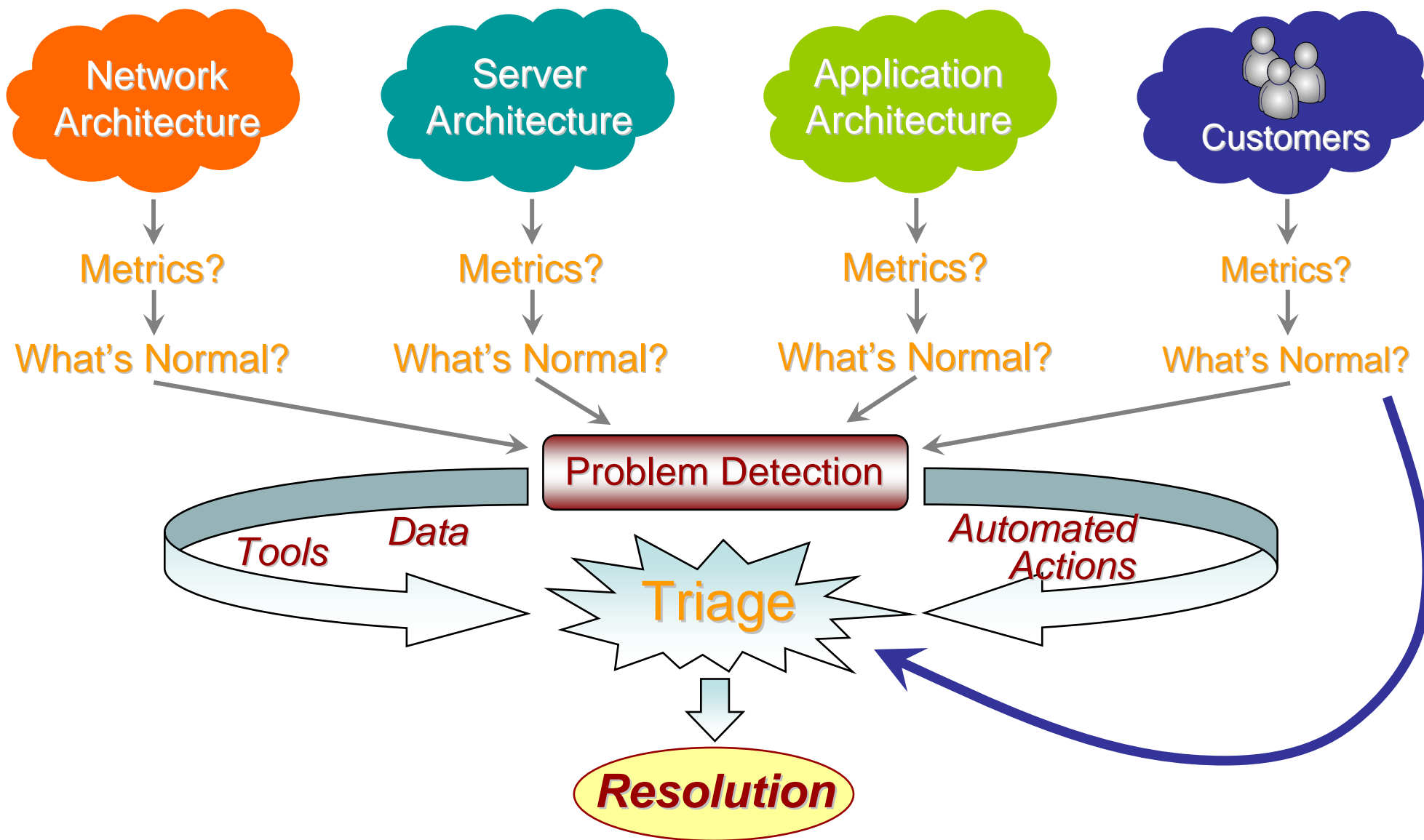
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Rule #2: If the customer is wrong...refer to Rule #1

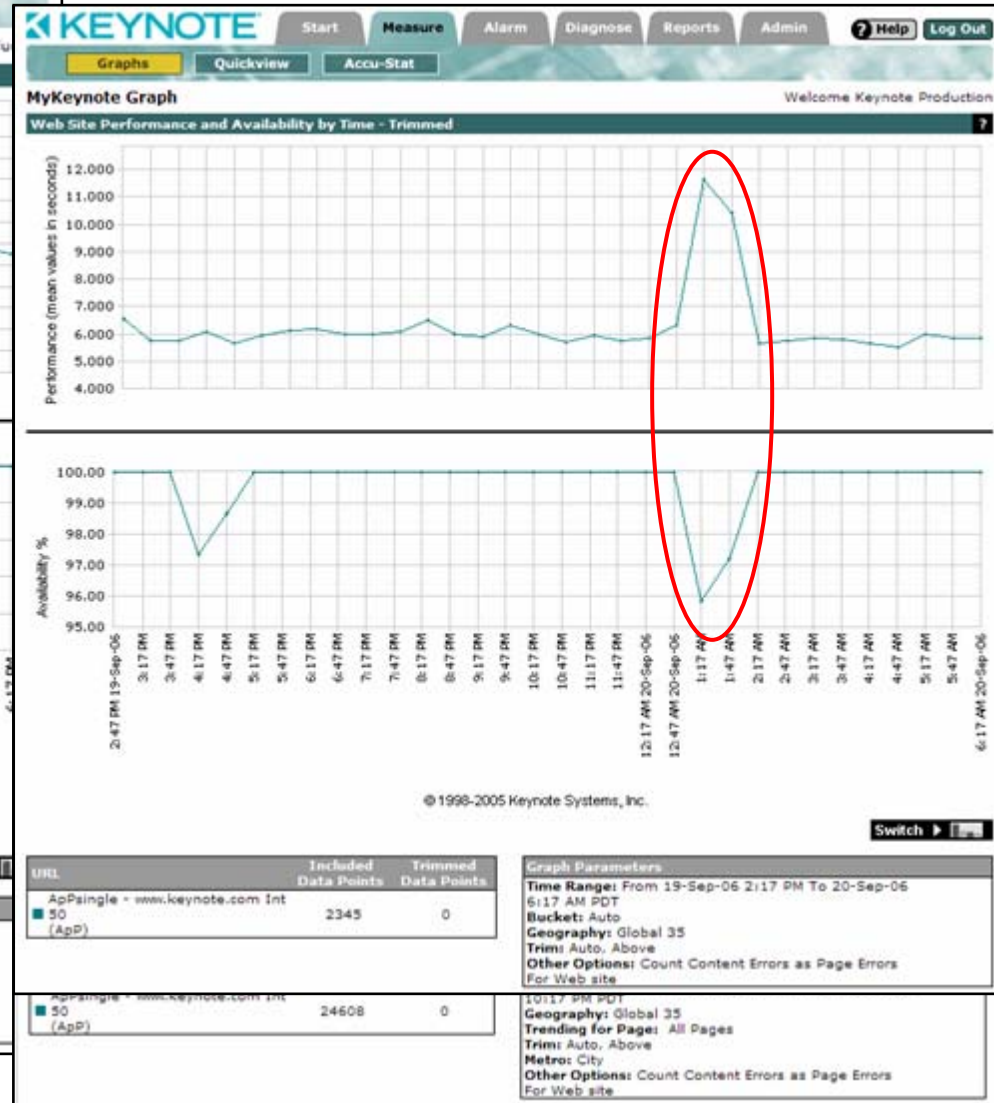
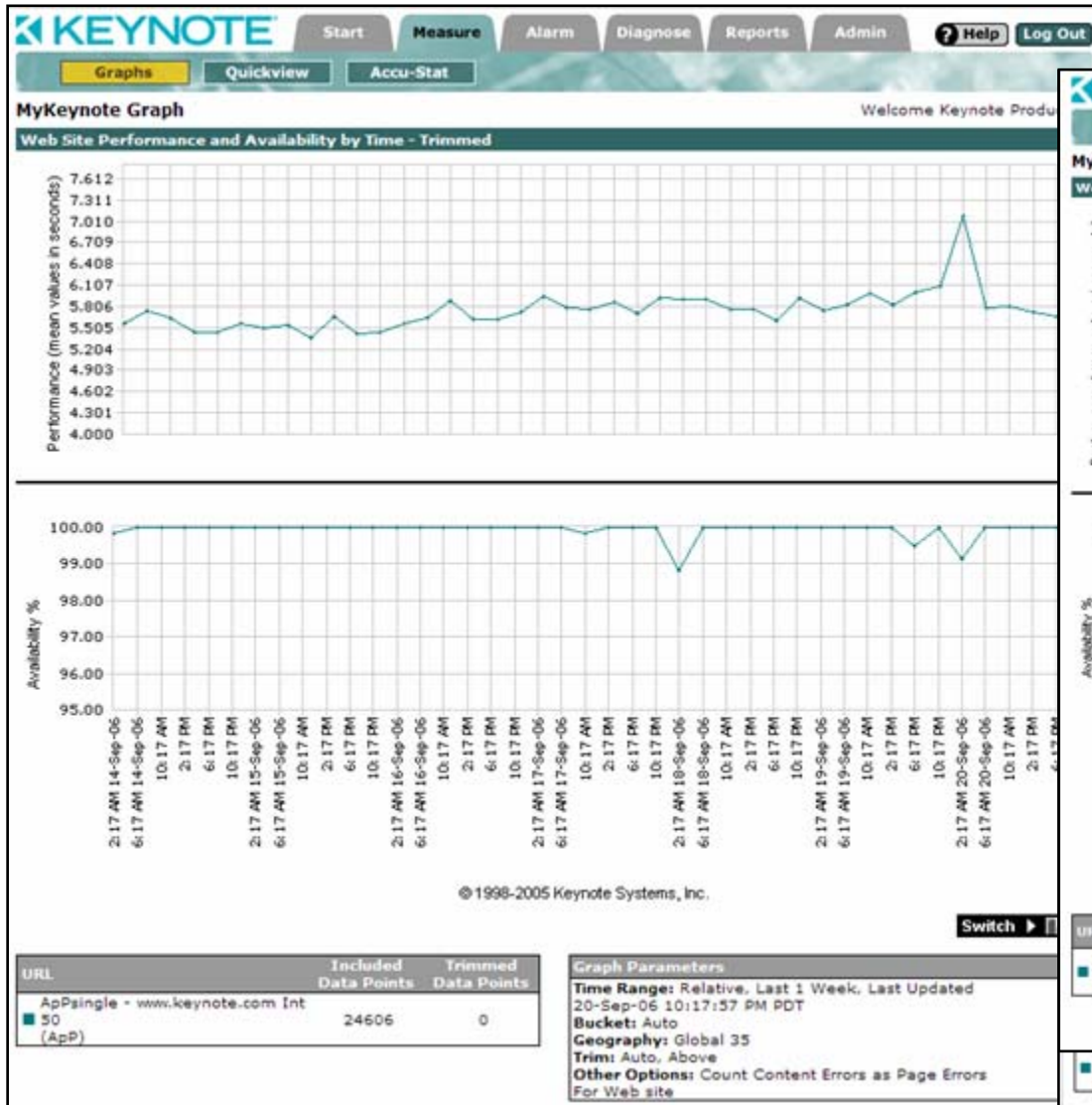
- **If changes are necessary (usually they are)**
 - Ease changes into production (if possible)
 - Many problems are caused by a “fix”
 - Business Objectives should drive changes

Keeping It All Under Control

Best Practice: Triage/Problem Resolution



Keeping It All Under Control Application Perspective (Global 35)



Keeping It All Under Control

Scoreboard / Internet Health Report



Conclusion

- WebOperations requires **a different way of thinking**.
- By definition, WebOperations is complex—**standardize** as much as possible.
- You can't manage what you don't measure so **plan ahead**.
- Understand your organization's **business objectives** and most importantly...**your customers!**
- **Integrate those objectives** into your management framework.
- **The impact of those objectives** should direct resources and priority...and ultimately change.

Thank You

Questions or...just bored?

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