

IEEE CQR BREAK OUT SESSION ON
SERVICE RELIABILITY

1998 Focus Area Session Chair	Mike Torterella, Lucent
1998 Focus Area Champion:	Cleayton Mills, Nortel
1998 Focus Area Editor:	Art Menko, Business Planning, Inc
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1999 Focus Area Champion:	Haroon Fariki, Ascend
1999 Focus Area Editor:	Belkacem Manseur, Lucent
2000 Focus Area Session Chair	Edwin Lambert, Lucent
2000 Focus Area Champion:	Jack Olivieri, Lucent
2000 Focus Area Editor:	Francoise Sandroff, Telcordia
<u>Participants</u>	

- [Definition](#)
- [Metrics](#)
- **World Class Performance**
- **Best Practices**
- **Best-in-Class Recognition**

Material from 1998 Workshop (5/5, Indian River Plantation Marriott Resort, Stuart, Florida):

I. DEFINITION

Service Reliability is . . .

1. Accessibility - Service is available when desired (when the customer wants to use it).
2. Continuity - Customer has uninterrupted service over desired duration.
3. Performance - Meets the customers' expectations.

Other areas that we would like to consider working into the definition had we more time:

1. Value - Negotiate a contract with the customer that places a value for a certain level of service requirement.
2. Needs customer participation or input from a global perspective.
3. Billing operational issues need to be considered.

Service Reliability is not . . .

1. It is not network reliability
2. It is not necessarily what we (those in attendance) think it is. Instead of listening to ourselves, we need listen to the customer.

II. METRICS

Service Reliability can best be measured by . . .

In the time allotted we could not form a consensus on service metrics. Concepts discussed in this initial round that we need to develop, include:

1. The metrics of accessibility and continuity are common to all transactions. However, not all transactions share a common set of metrics. Or different measures for different services. For instance, Internet type transactions need measurements for getting on line, download time, URL accuracy, quality of MPEG and so on.
2. The ratio of successful transactions over total transactions would be a good measurement for accessibility and continuity.
3. Some subjective testing from the customers' perspective, using customer surveys and complaints.
4. Internal network measures, such as: outages, duration, blocked calls, incomplete calls and features not available.
5. Employing external customer measures. Interviewing customers to find out their experience, asking questions like "Did you have any outages?"
6. The ratio of success to attempts would be a good measure for accessibility, where time period, number of customers and successes are factored in. And where successful attempts are completed within a specified period of time.
7. For continuity the following ratio is suggested: the transactions successfully completed divided by the transactions successfully initiated.
8. For performance the following types of metrics should be considered: total delay time during transaction, delay during setup, delay after setup, and distortion.

Material from 1999 Workshop (4/20, Rancho Bernardo Inn, San Diego California):

Initially, the team focused on defining a “failure” before discussing the metrics to measure Service Reliability. The following table was developed as a framework:

Note: “transaction” is the unit for Service

	Breakdown Failures	Performance Failures
Service Accessibility	<ul style="list-style-type: none"> No response at all No response to an input Failure to connect 	<ul style="list-style-type: none"> Delayed response Incorrect response Partial response Incorrect destination
Service Continuity	<ul style="list-style-type: none"> Premature termination Unacceptable performance 	<ul style="list-style-type: none"> Performance threshold not met Degraded performance
Service Release	<ul style="list-style-type: none"> Inability to end a transaction No confirmation 	<ul style="list-style-type: none"> Delayed release No confirmation of a transaction Incorrect release Billing error

Then, the following table shows the team progress towards metrics.

Note: “transaction” is the unit for Service

	Breakdown Metrics	Performance Metrics
Service Accessibility	Probability of: { time “t” to provide a correct response $\leq T_{s1}$ }, where T(s) is an agreed threshold	Same probability, but $T_{s1} \leq t \leq T_{s2}$, Where T_{s2} is performance threshold
Service Continuity	<ol style="list-style-type: none"> # of cut-offs / total calls connected # of transaction completed /total transactions initiated 	<ol style="list-style-type: none"> # of calls connected exceeding some threshold / total calls connected # of transaction exceeding some threshold /total transactions initiated
Service Release		

Other agreements:

- Add references to the standards for Service Reliability Metrics
- Metrics are to be related to quality/reliability of service as perceived by end-user.

- 3) Metrics should be independent of the type of technology used to provide the service.
- 4) A metric may not be directly measured, but it could be statistically estimated
- 5) Unit of service is transaction. Measurements could be a count of defects.

Material from 2000 Workshop (4/19, Creta Paradise Beach Resort, Chania, Island of Crete, Greece):

AGENDA

- Introductions – Name, Company, Why interested, Goal
- Process we will use
- Review Maturity Model
- Review of previous work (CQR 1999)
- Output/Goals for this breakout
 - Metrics Finalization – Simple
 - World Class Performance – Simple
- How we will accomplish the goals
 - Brainstorm
 - 3-10 Participants per sub-team
 - Pick 2-3 top metrics and performance goal
- Presentation by each group
- Consensus

Minutes of Meeting

MATURITY MODEL REVIEW

Goal:

1. Try to solidify and finish the work done last year on metrics
2. Requirements and refine best in class

CONSENSUS DETERMINATION

- Not a unanimous vote –
- Majority Vote? –
- No vote, but ask if people can leave with it and support it – **Chosen Mode of Operations**

OUTPUT AND GOALS

Metric finalization

Performance Goal must be simple and understandable, meaningful and useful

FORMAT OUTPUT TEMPLATE

- DEFINITIONS
- METRICS
- BEST IN CLASS

Break-up into groups – Brainstorming session – 10 minutes – 2 or 3 top metrics.
Review of last year's output

METRICS FINALIZATION

Goal: Same definition independently of the type of service.

DISCUSSION

Group 1.

Addition: "Defect" word.

Defects Per Million (DPM) uses the word defect and this may lead to confusion.

Failed transactions / million transactions – end-to-end - TPM

Service target: measured in terms of accessibility / continuity / release

Failed Response

Group 2.

Definition of a transaction and the quality must be negotiated with the service user

Failed transaction

Operational Profile

Group 3.

Make sure that variables are measurable.

Group 4.

Redefinition of the Service Accessibility. Methods of measurements were discussed. More work was needed in this area.

1. Definitions

a) Updated/ edited

Page 1 of CQR1999 document

Accessibility: Service is available as designed when and where the customer wants to use it

Continuity – change “desired” to “defined”

“Performance” to “Success Criteria”

Page 3 of CQR1999 Document

Top of Matrices should be labeled Success Criteria with the cells blanked out for now. Later we need to put in best in class success criteria (individuals can use the matrix to put customer requirements.)

e.g.

	----- Success Criteria -----		
Service	Breakdown	Performance	Other
Access			
Continuity			
Release			

b) Added

Service Reliability must be specified for the particular operational environment

Success Criteria – meets the customer’s expectation per agreement between customer and service provider (e.g. SLA, advertising..)

Release – the service transaction terminates properly

Transaction: a unit of service

Successful: A completed action as defined to by customer

FTPM: Failed Transactions per Million

2. Service Reliability Metrics:

a) Service Unreliability (FTPM)= $10^6 * (1 - \text{Transaction Success Ratio})$

where Transaction Success Ratio=(Number of successful transactions/ number of attempted transactions)=

(Number of successful attempts/ Total Attempts) * (Number of successful transactions during continuity phase/ Number of successful accesses)* (number of successful service releases/ number of successful continuities)

b) Service Reliability (%) = $100 * (\text{Transaction Success Ratio})$

Notes:

1. Many different ways to measure a metric
2. Differentiate between metrics and measurement

PARTICIPANTS

The 1998 working group participants consisted of the following industry professionals.

Name	Company
Dietl, Thomas	Deutsche Telekom AG
Dorr, Gunther	Deutsche Telekom AG
Hamilton, Clinton	Bellcore
Hanel, Damian	Nortel
Harshe, Girish	Lucent
Hoeflin, David	AT&T
Huang, Steel	Lucent
Ingraham, Terry	Sprint
Jones, Allan	Bellcore/Pacific Bell
Macwan, Anil	Lucent
Makris, Spilios	Bellcore
Marlow, Norman	Motorola
McCain, Archie	BellSouth
Melgara, Marcello	CSELT
Menko, Art	Business Planning, Inc.
Mills, Cleayton	Nortel
Perris, Eve	Bellcore
Snow, Phillip	DSC
Tortorella, Michael	Lucent
Walling, Kenneth	Pacific Bell
Yu, Weider	Lucent

The 1999 working group participants consisted of the following industry professionals.

NAME	TITLE	COMPANY	STATE/ COUNTRY
Blue, Richard	TCQR Workshop Treasurer.	Siemens ICN	Florida, U.S.A.
Bonelli, Raymond	CQR/Conf. Arrangement Chair	Lucent Tech.	Illinois, U.S.A.
Caravano, Joan	Manager	AT & T	New Jersey, U.S.A.
Chen, Chi-Ming	Prin. Tech. Staff Member	AT & T	New Jersey, U.S.A.
Chiles, Wayne	Member Tech. Staff	Bell Atlantic	Virginia, U.S.A.

DelCol, Chris	Dir, Global Cust. Sat.	Ascend Comm.	California, U.S.A.
Dietl, Thomas	Dipl.-Ing. Univ.	Deutsche Telekom AG	Nurnberg, Germany
Doran, Marvin	Mem. Sci. Staff	Nortel	Ontario, Canada
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Hushyar, Kaveh	Division Manager	AT & T	New Jersey, U.S.A.
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Neeman, Susan (Sam)	Director Tech. Sup.	Cisco Systems, Inc.	California, U.S.A.
O'Reilly, Kathleen	Consumer Representative	Michigan Consumer Federation	District of Columbia, U.S.A.
Rak, Daniel	Technical Manager	Lucent Technologies	Illinois, U.S.A.
Thayer, Whitey	Senior Engineer	Federal Commun. Commission	Washington, D.C., U.S.A.
Walsh, David	Sr. Manager Escalation Support	Ascend Commun.	Sophia Antipolis, France
Yaniro, Dan	District Manager	AT & T	New Jersey, U.S.A.

The **2000** working group participants consisted of the following industry professionals.

Jack Olivieri – Lucent - Area Champion
 Belkacem Manseur – Lucent - Service and Network Reliability – Products / Solutions – Group 4
 Kent Felske, Nortel Networks - Strategy of Networks Reliab. – Group 1
 Edwin Lambert - Lucent Technologies – Network Reliab, Group – Group 1
 Dan McMenamin – Maintenance Engineer – Wireline – Bell Atlantic – Group 3
 Dave Hoeflin – AT&T Labs, Service Reliability – Group 2
 Steel Huang - Lucent – Concrete Schemes to use for software and HW dev. – Group 2
 Michael Ketcham – Motorola – Issues w. Wireless Networks – Industry trends? – Group 2
 Dan Rak – Lucent Technologies – SW Quality and Reliability – Group 2
 Karl Rauscher – Lucent Technologies – Group 4
 Yoshiharu Yamasaki – NTT - Nagano Olympic Games - Service Q. for mobile services - 3
 Roald Evholdt – Norwegian PTT – National Committee Chairman – Deregulation Issues – Group 4
 Yoshiharu Takizama – NTT – Group 4
 Konstantinos Rogalas – Intrasoftware - IT background – Telecom Reliability – Group 3
 Zeiad El-Saghir – Student from U. in Poland – ATM switch Reliability
 Esmat Mahmoud - AT&T
 John Harrison – BT - Network Security – Group 1
 John Baeglasman – Cisco – Group 2
 Francoise Sandroff – Telcordia Technologies – Group 4 – Area Editor
 Syed Ali – Telcordia Technologies – Group 1