



Agilent Technologies

Fraud & Wholesale: Exposing Unscrupulous Activity

February 27, 2003

presented by:

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Agilent Technologies**

Agenda

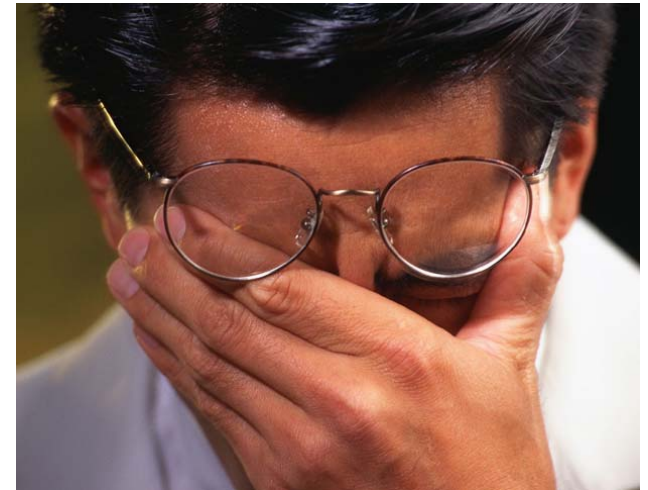
- **Challenge: detect and manage fraudulent activity**
- **The Fraud problem: size, impact, spectrum**
- **Solution evolution: paper records to neural networks, success stories**
- **Sources of Data**
- **Dark Arbitrage problem, success stories**
- **Products & solutions**



Service Provider Challenges

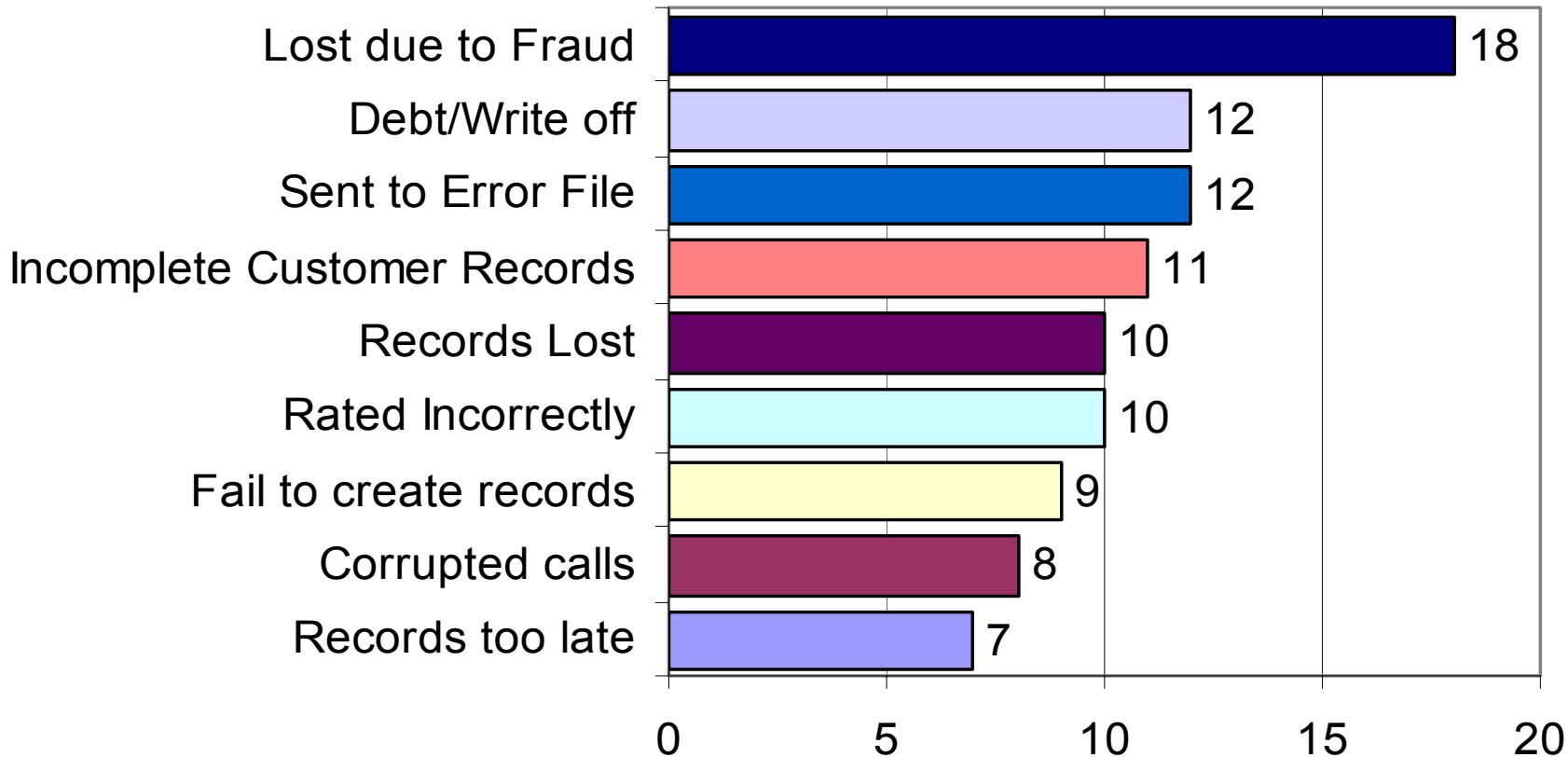
- **Reduced headcount, price-points, margins & profits**
- **Continued CapEx and OpEx reduction**
- **Maximize use of existing equipment**
- **New service roll-out and evolution**
- **Retain your best customers**
- **Maximize revenues realized**

“Do more with less...”



Challenge: Revenue Leakage Sources

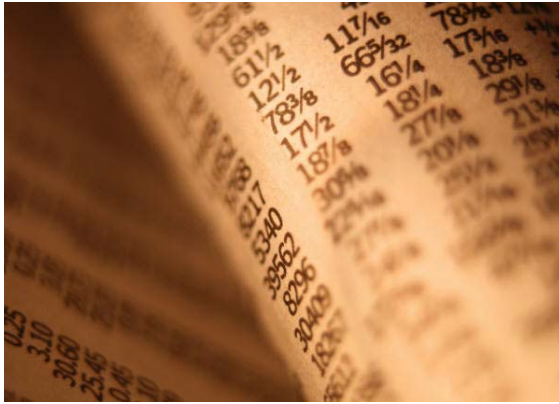
“33% of companies don’t know if they have a revenue leakage problem” Survey by Deloitte & Touche



Causes of Lost Revenue (%) Source: Phillips Group (2001)



Fraud: the Impact



**\$55 Billion Lost Annually
to Telecom Fraud**

FIINA

**Single fraud events may
easily exceed \$1m**

Financial Times

**Omnipoint announced US\$9.6
Million sting.**

- Market cap down **US\$1.1Bn**
when Revenue up **200%**
- Stock price fell from
US\$28 ⁵/₈ to **US\$7 ⁵/₁₆**

**Asia Cell Phone Firms May Lose Up to 30% of
Revenue ...**

.... because of revenue leakage from fraud, bad
debts or poor billing systems. Also noted **1%**
gain in revenue translated to a **10 percent**
increase in shareholder value.

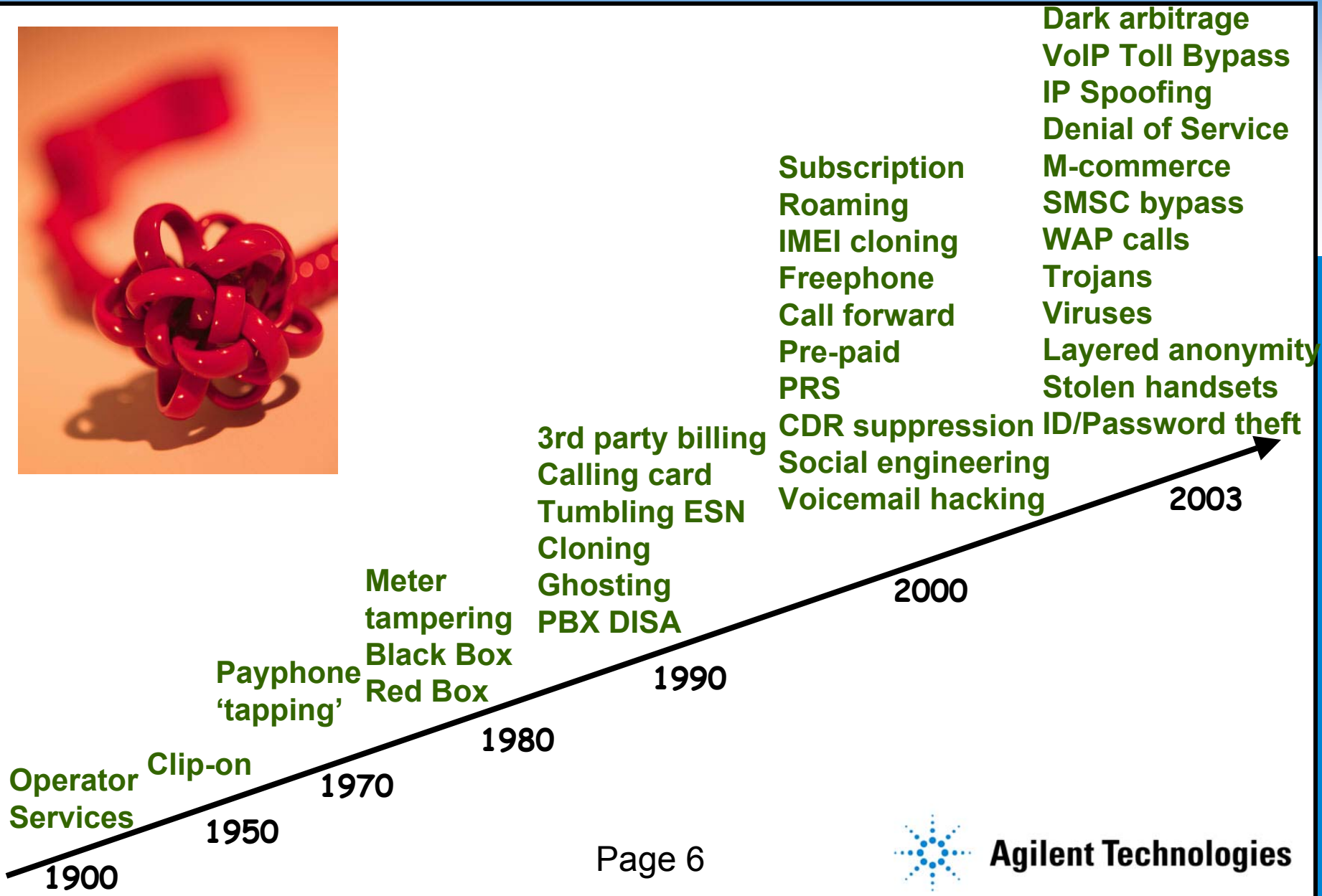
PWC Singapore

*“Hackers cost American
businesses more than \$4
billion a year*

(Telecom & Network Security Review)



Fraud: constant evolution



Fraud: Perpetrators

Not just Customers....

- **Insiders- employees/contractors**
- **Organized crime**
- **Wholesalers**
- **Service Providers**
- **Dealers**



Hot Topic: International Resale Fraud



Modus Operandi:

- Establish business relationship with operator
- Offer discounted prepay services to customers
- Pay first 2-3 months, then dispute
- Reduce prices, increase volume & debt
- Disappear when recovery action threatened
- Move to next victim (another country)
- \$5 to \$10 million loss expected for each incident



Fraud Solution Technology Evolution

Hybrid Solutions

Behavioural Profiling

Network Signalling Data

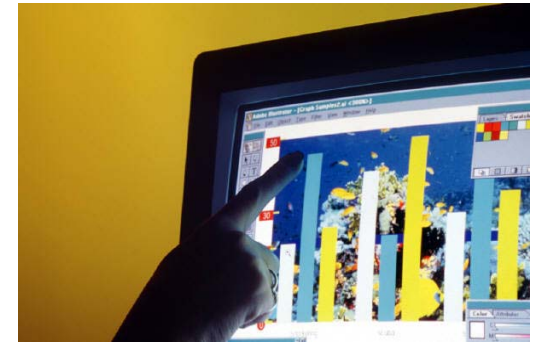
Call Detail Data Mining

Rules & Thresholds

Switch CDR Report Analysis

“Systems that accept both CDRs & SS7 data and combine them with neural analysis give a really good picture.”

Larry Kepfer – BellSouth



Neural Network Benefits

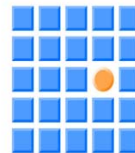
Rules/Thresholds (R/T) Only

- Can't identify fraudulent behavior
- Many false alarms
- Much fraud stays under thresholds
- Fraudsters adapt to thresholds
- High maintenance



R/T + Neural Network

- Profiles each customer
- Identifies fraudulent behavior
- Fewer false positives
- 10x more effective at detection
- Less analyst training needed
- Self-learning
- Fraud analyst efficiency gains



CEREBRUS
SOLUTIONS
LIMITED



Success Story- PRS fraud

Problem: Tariff set too low for calls from US operator to UK PRS. Fraudster sets up PRS in UK, pays US locals to generate calls to PRS.

Solution: Cerebrus generated alarms for large numbers of identical international calls.

Results: Operator fixes tariff, prevents further exposure to loss.



Success Story- Voicemail Fraud

Problem: When VM retrieval cost reduced, fraudsters exploit two vulnerabilities: default mailbox PIN (1234) and billing platform problem.

1. Call Transfer feature used to dial out of mailbox to anywhere in country.
2. Users call voicemail, use Call Return feature to dial anywhere in country. Call Return billing not configured correctly for large number of customers.

Solution: Cerebrus detects excessive volumes of long-duration calls to voicemail- 2x usual number of calls, 3x aggregate duration

Results: Vulnerabilities closed off, revenue leakage stopped.



Success Story- Multi-way call fraud

Problem: Equipment mis-configuration allowed calls to toll free numbers when put on hold to permit conference call to a second number – abused to call international and Premium Rate Services.



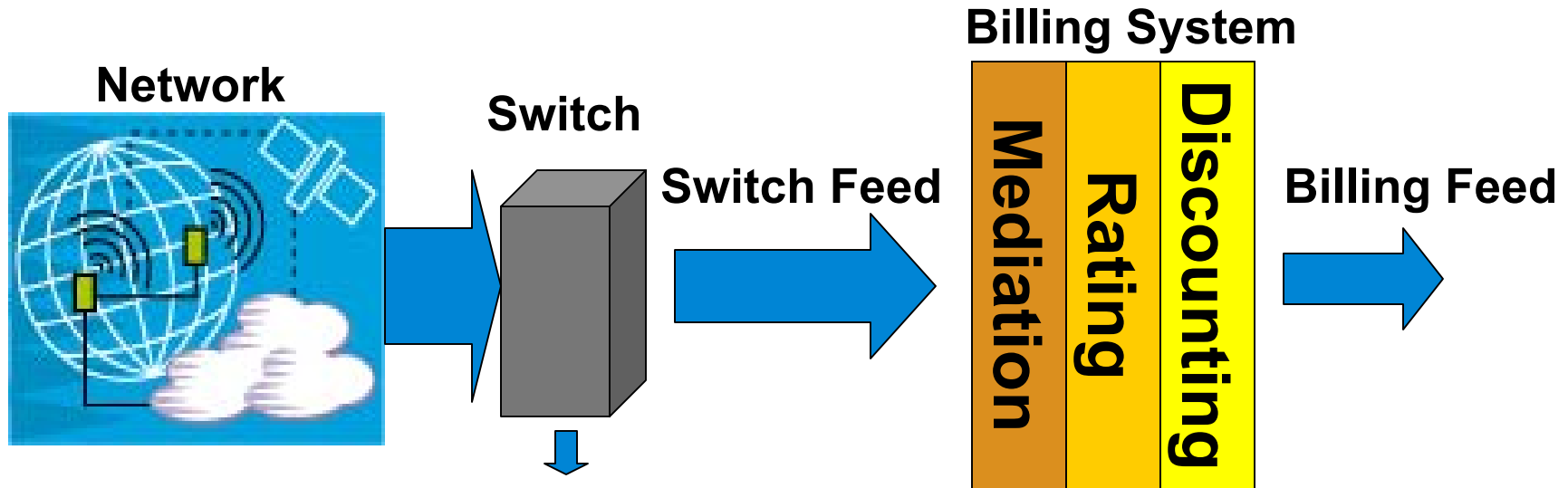
Solution: Cerebrus generated alarms for overlapping calls and excessive use of conference call feature for pre-paid customers with no access to these features.



Results: The operator estimates it **saved \$2 million** by solving the problem before it became more widely known and exploited by its pre-paid base



Data Sources- No Signaling data

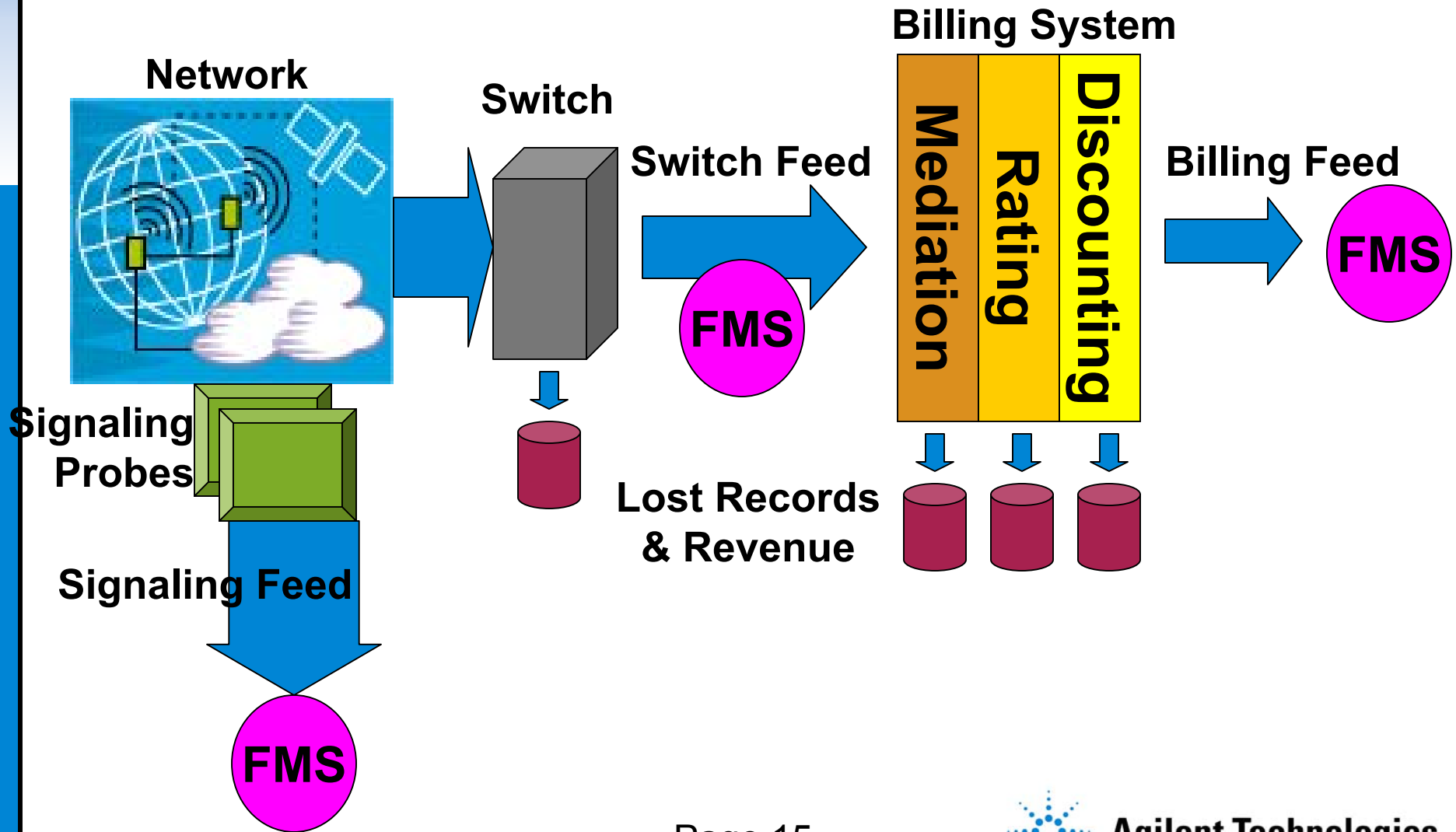


Switch Config Errors
Equipment outages
Switch overload
Dropped CDRs
Suppressed CDRs
New service problems
Error logs

Process errors
Server outages
Data too late to bill
Parsing errors
Correlation failure
Incorrect account data
Error Logs



Data Sources- Signaling Data



Data Sources: SS7 Data

Rich

- Complex call models (Calling Card, 800, etc.)
- Records calls switches don't (incomplete)
- Abnormal call events (unanswered)
- Record of Outbound and Inbound calls



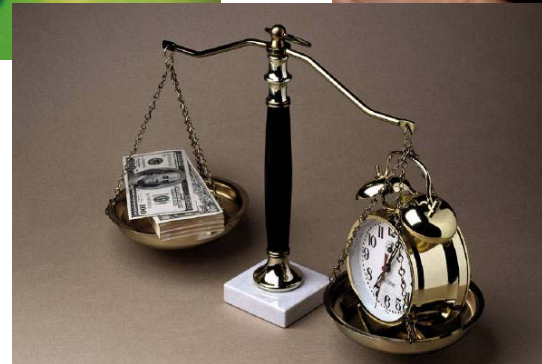
Accurate

- Complete record of service usage
- Times call events precisely
- Available immediately (not batched)
- Provides in-progress call data



Efficient

- No load on network equipment
- Consistent output format
- Scalable, superior to sampling
- No need for complex mediation
- SS7 data is cheaper to collect



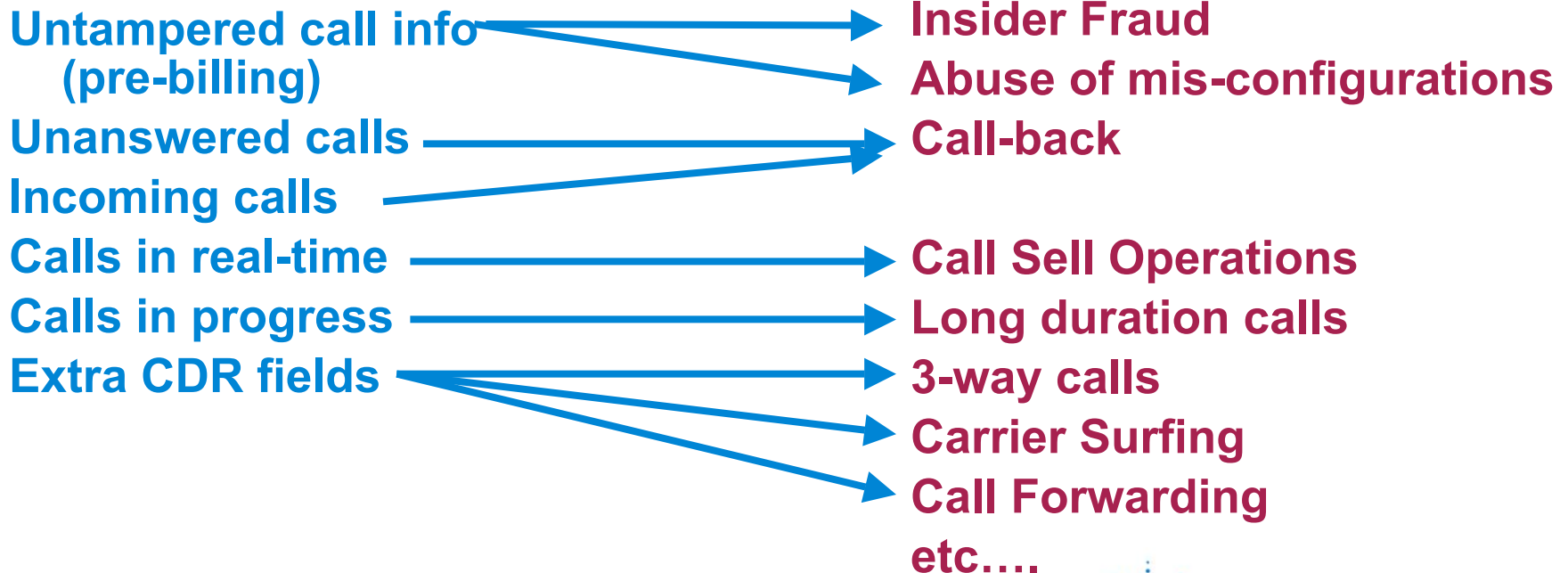
SS7 CDRs for Fraud Detection

Switch CDRs (and SS7 CDRs) provide basic data:

Outgoing calls
Completed calls



SS7 CDR Features provide additional value for Fraud Detection:



Success Story- Insider Fraud

Problem: Bad payers disconnected from international service, but insider re-enables service for friends and family without enabling billing. Many high-value, long-duration international calls made.



Solution: SS7 CDRs generated for these calls, investigation finds no corresponding billing records.



Result: Service disabled, action taken against insider. Further revenue loss stopped.



Success Story- Revenue Leakage

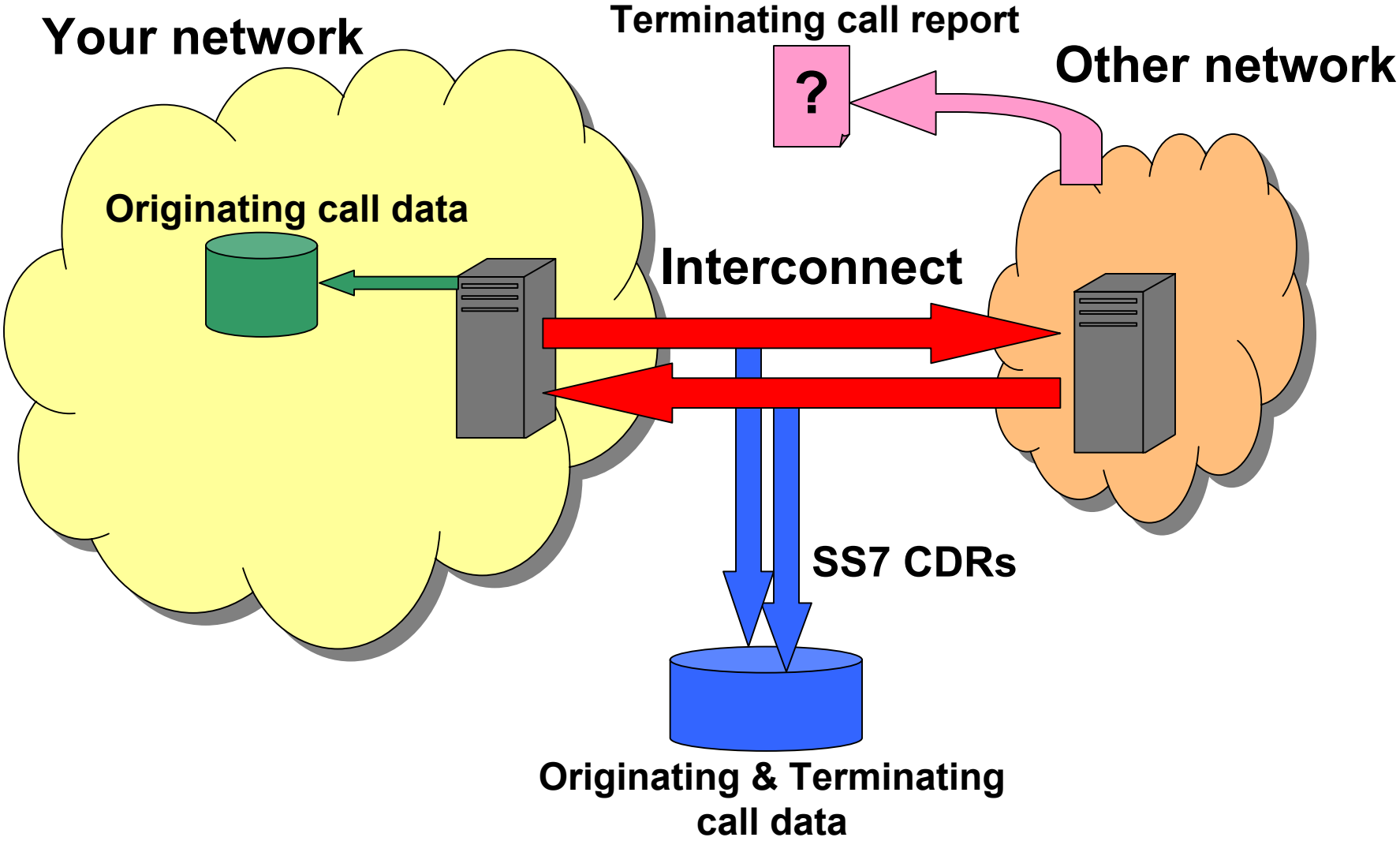
Problem: Rating platform hiccup causes in-process records to be lost. Some long-duration calls not billed.

Solution: Presence of acceSS7 CDRs for these calls (and no corresponding billing records) indicate a problem with billing system.

Result: Process improvement identified for rating system. Revenue leak plugged.



Dark Arbitrage: Service Provider Fraud



SS7 CDRs for Dark Arbitrage Detection

Switch CDRs (and SS7 CDRs) provide basic data:

Outgoing calls

Completed calls

SS7 CDR Features provide additional value for Dark Arbitrage detection:



Incoming calls	—————→	Visibility of Terminating calls
Independent of Billing System	—————→	Independent source for reporting & comparison, fewer lost CDRs, increased % Revenue from interconnect
Independent of Switches	—————→	
Unanswered calls	—————→	
Incomplete calls	—————→	



Success story –Arbitrage detection

Problem: Other carriers exploiting rate differentials for various traffic types by disguising one type of traffic as another

Solution: Using SS7 CDRs, the LEC was able to demonstrate that calls were being tampered with in order to disguise their true nature, e.g. by changing CPN party numbers

Result: Successful prosecution, over \$20M paid back to LEC.



SS7 Data Source: Summary

- Detecting fraud on the network
- Verifying inter-carrier billing
- Analysing the source, destination and type of interconnect traffic
- Monitoring network services
- CDR data warehouse: “slice and dice”, generate intelligence on network, services and customers
 - analysing end-office traffic patterns, determine most cost-effective deployment of new voice trunks
 - measuring the quality of service provided by interconnect partners in order to select the best routing for customers

“Agilent’s SS7 monitoring platform, acceSS7, is absolutely pivotal to the interconnect revenue assurance programs of the large U.S. carriers. And the sums of money that Agilent’s platform is saving those telcos are very large indeed.”

Business Case: Fraud Loss

Revenue	\$1,000,000,000
Earnings	\$150,000,000
Market Cap	\$3,750,000,000
Fraud as % of revenue	3%
Annual Fraud Loss	\$30,000,000



Business Case: ROI

Reduction of fraud	25%	10%
Example Solution Cost	\$2,000,000	\$2,000,000

Corresponding *impact* on:

Earnings	+\$7,500,000	+\$3,000,000
Mkt Cap @ P/E of 25	\$131,250,000	\$52,500,000
Mkt Cap @ P/E of 15	\$78,750,000	\$31,500,000

And results in significant financial benefit -

Payback (weeks)	14	35
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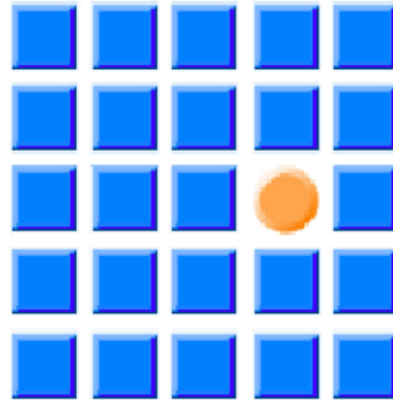


Cerebrus RE- summary

**High Detection
Rate**

**Practical and
User-Friendly Tool**

**Unique,
leading-edge
fraud management
system**



**Proven
Neural Network
Capability**

**Product Evolution in conjunction with
Customer Base**



Agilent acceSS7 solutions



Agilent Technologies

- **SS7-based solutions since 1994**
- **acceSS7 industry and market leader in signalling monitoring**
- **Proven, reliable platform**
- **Used in over 100 service providers worldwide**
- **Scalability: from 5M/day to >400M CDRs/day**
- **Solution Portfolio covers spectrum from Protocol Analysis to Business Intelligence:**
 - **Network assurance**
 - **Service assurance**
 - **Revenue assurance**
- **Broad coverage of network technologies & services**
- **Services portfolio- installation, maintenance and support.**
 - **Consultancy- helping you extract maximum value from your network data.**



Effective Fraud Management Delivers

- ✓ **Reduced leakage – improved revenues**
- ✓ **Increased profits & shareholder value**
- ✓ **Protection of new products & services**
- ✓ **Reduced bad debt**
- ✓ **Increased customer retention**
- ✓ **Rapid Payback (less than 6 months)**



Revenue Assurance Workshop

Would you like a FREE customized Revenue Assurance Workshop at your site that will explain how to find more revenue from your network?



- **Enable cross functional understanding of how the solutions can directly affect your business**
- **Show functional examples of how Agilent solutions address specific problems**
- **Demonstrate how Agilent's solutions can help identify problems faced by your company**

**Fill out the evaluation form at the end of this presentation and check "yes" for our free workshop.
An Agilent Representative will contact you soon.**



Agilent Revenue Assurance eSeminar Series

ARCHIVED

Wholesale Billing

Ensure Interconnect
Partners Pay for What
They Use

Sales & Marketing

Target and Keep Those
Valuable Customers
Tuesday, March 4th
11:00am PST

TODAY

Fraud & Wholesale

Exposing
Unscrupulous Activity

Network Management
& Planning

Optimise Your Traffic
& Profit from the Results
Thursday, March 6th
11:00am PST

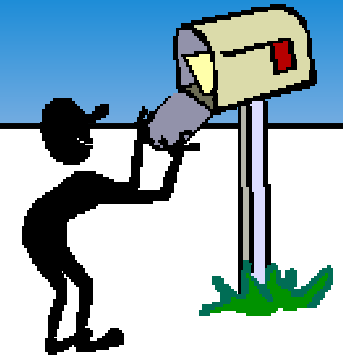
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