

# International Roaming Fraud Trends & Prevention Techniques

Fair Isaac Corporation

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# Agenda

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- ▶ Who is Fair Isaac?
- ▶ Wireless Fraud Statistics & Trends
- ▶ Common Roaming Fraud Techniques
- ▶ Roaming Fraud Detection Methods
- ▶ RoamEx - Roamer CDR Exchange

# Fair Isaac: The Company

- ▶ Established in 1956, now 2300 employees
- ▶ NYSE: FIC; Annual Revenue = \$630 Million
- ▶ Invented the credit risk scorecard (FICO score)
- ▶ 15 Billion decisions per year using our score

## Telecommunications

- ▶ 100+ telecom providers worldwide
- ▶ 100% of top 10 US wireless providers
- ▶ 7 of top 10 US wireline providers

## Fraud

- ▶ 85% of all US credit card transactions
- ▶ 65% of world's credit card transactions
  - ▶ 450 million payment cards
  - ▶ 12 billion payment card transactions/year
- ▶ Roaming CDR exchange for 70+ wireless providers

## Financial Services

- ▶ 7 of top 10 banks worldwide
- ▶ 40 of 50 largest US institutions
- ▶ 74% of US bank cards
- ▶ 75% of US mortgage originations

## Telecom Solutions

### Fraud, Analytics and Decisioning

- ▶ **Risk Manager** fraud detection using neural technology
- ▶ **RoamEx** near real-time roamer call detail exchange network
- ▶ **HUR Manager** automated high usage reports for roamers
- ▶ **Teladaptive** scoring and decisioning for delinquency and churn management
- ▶ **Liquid Credit** pre-screening for potential fraud and risky acquisitions

## Wireless Fraud is a Reality

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- ▶ Between 1% and 3% of an operator's revenue is lost to fraud each year (Billing World)
- ▶ Roaming fraud is currently running at 24% of the total fraud amount (GSM Association)
- ▶ 50-70% of fraud loss is hidden as bad debt (Gartner Group)
- ▶ 20–30% of bad debt is subscribers who never pay (TMNG)
- ▶ Over the last several years, there have been multiple instances of >\$500,000 lost *per incident*

## Current Wireless Fraud Trends

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- ▶ Subscription fraud and identity theft
- ▶ Agent and reseller fraud
- ▶ Network and equipment hacking
- ▶ Internet exchange of fraud information
- ▶ Insider fraud and collusion
- ▶ Social engineering
- ▶ Premium rate service fraud
- ▶ Call selling operations
- ▶ International roaming fraud

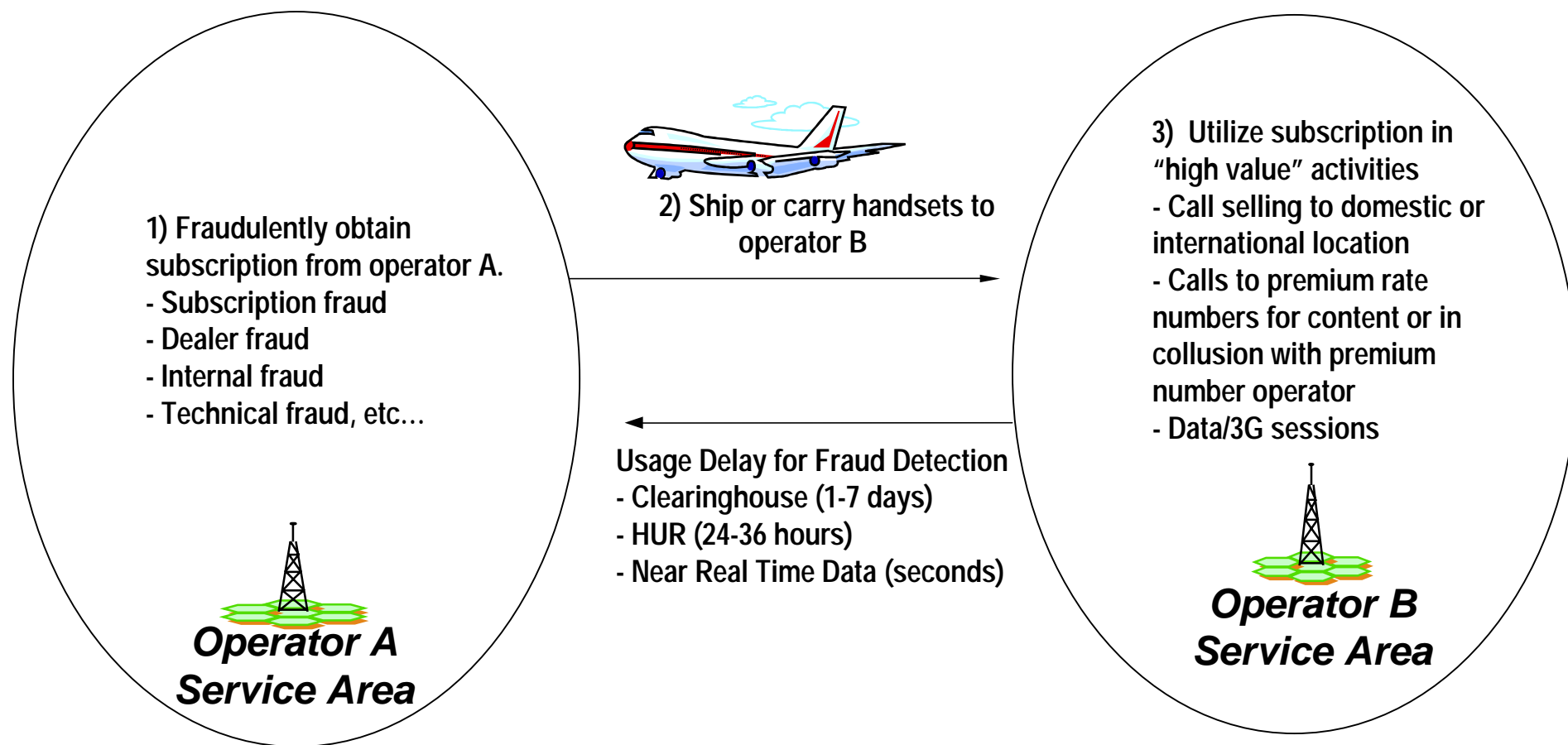
*Often methods are used in combination with each other*

## 3G Wireless Fraud

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- ▶ 3G faces a combination of wireless and internet fraud techniques
- ▶ Viruses and Trojan horses (download of executable files)
- ▶ Malicious code that calls premium numbers or delivers unwanted content (MT charging)
- ▶ Equipment theft and subsidy fraud (attractive 2.5G / 3G handsets)
- ▶ Illegal Downloading and Piracy: Ring Tones; Images; Characters; Video on Demand; Music; Games, etc
- ▶ DoS - Denial of Service Attacks including jamming and flooding
- ▶ Stealing data session user ID and password
- ▶ Mobile Commerce Fraud (CC Theft, Charge to Bill)
- ▶ Home and roaming environment

## Techniques for Roaming Fraud



*Exposure can be as much as \$10K per day per handset*

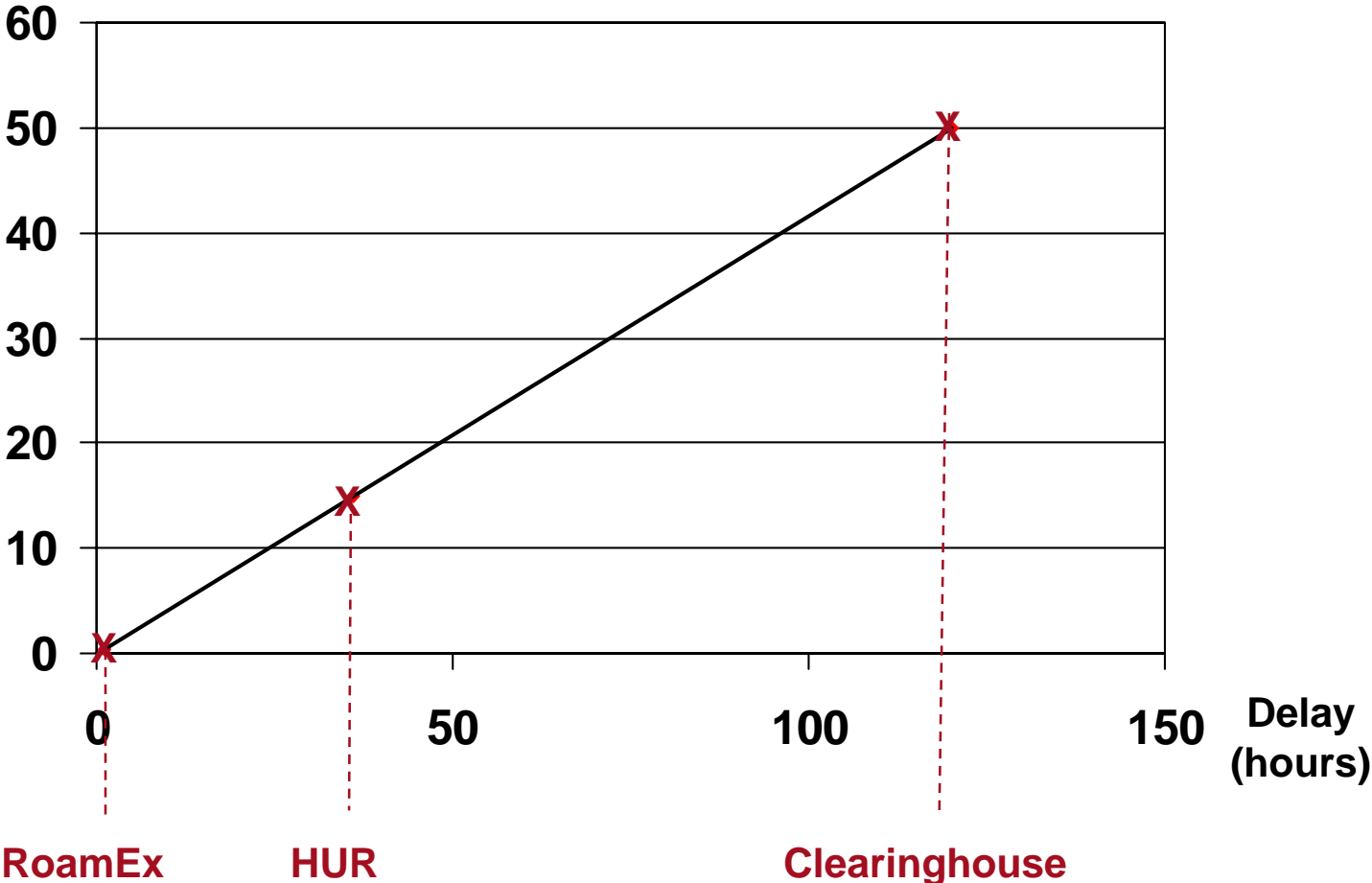
# Primary Roaming Fraud Detection Methods

DETECTION METHOD	INFORMATION PROVIDED	TIMING	LIMITATIONS
<b>Clearinghouse</b>	<ul style="list-style-type: none"> <li>•Individual call details</li> <li>•Individual call charges</li> <li>•Billing specific data</li> </ul> 	<ul style="list-style-type: none"> <li>•One to several days</li> </ul> 	<ul style="list-style-type: none"> <li>•High exposure</li> </ul> 
<b>High Usage Report (HUR)</b>	<ul style="list-style-type: none"> <li>•Call summary for subscribers that exceed threshold</li> <li>•Approximate charges</li> </ul> 	<ul style="list-style-type: none"> <li>•Every 24 to 36 hours</li> </ul> 	<ul style="list-style-type: none"> <li>•24 to 36 hour exposure</li> </ul> 
<b>Roamer CDR Exchange (RoamEx)</b>	<ul style="list-style-type: none"> <li>•Individual call details</li> <li>•Fraud specific data</li> </ul> 	<ul style="list-style-type: none"> <li>•Near real-time</li> </ul> 	<ul style="list-style-type: none"> <li>•Coverage dependent</li> </ul> 



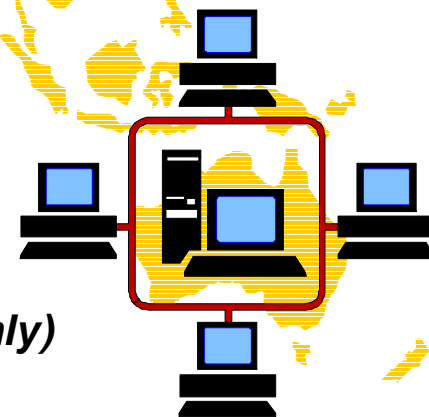
# Primary Methods Exposure Comparison

Loss per handset  
(\$US x1000)

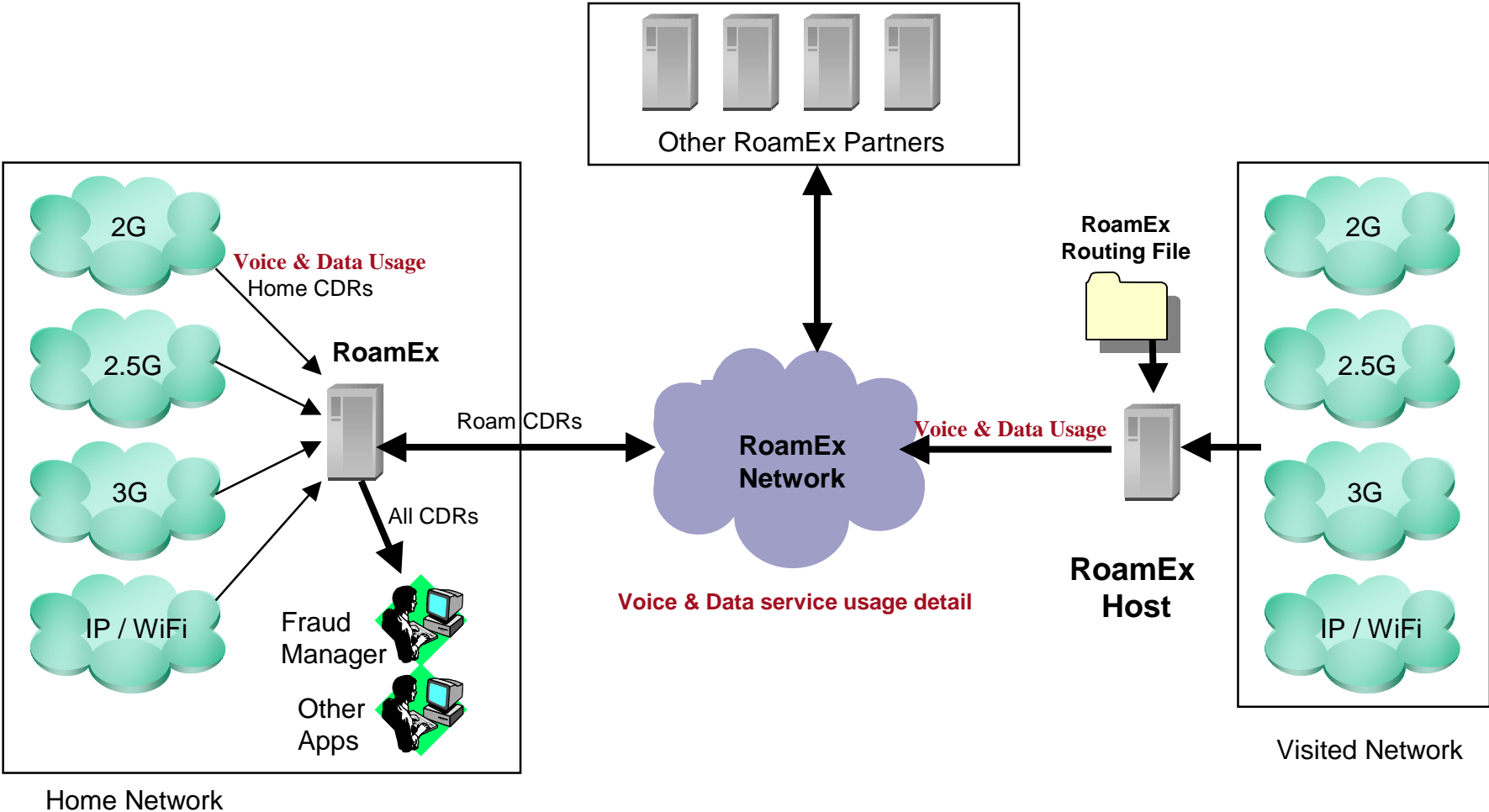


## RoamEx Background

- ▶ Operational since 1993, now supporting over 70 wireless carriers
- ▶ Near Real-time, global inter-operator data exchange network of roamer CDRs
- ▶ Supports multiple standards
  - ▶ *Wireless Standards: 3G, CDMA, 1X, GSM, GPRS, TDMA, AMPS, SMS*
  - ▶ *Support other proprietary formats requested*
- ▶ Covers ~95% of North American market
  - ▶ *United States, Canada, Mexico*
- ▶ Expanding internationally
  - ▶ *Europe, Asia, South America, Caribbean*
- ▶ Proven Capacity and Reliability
  - ▶ *60 Million CDRs daily; 1.8 Billion per month (roaming only)*
  - ▶ *3.9 Billion total CDRs per month, and growing*



# Baseline RoamEx Architecture



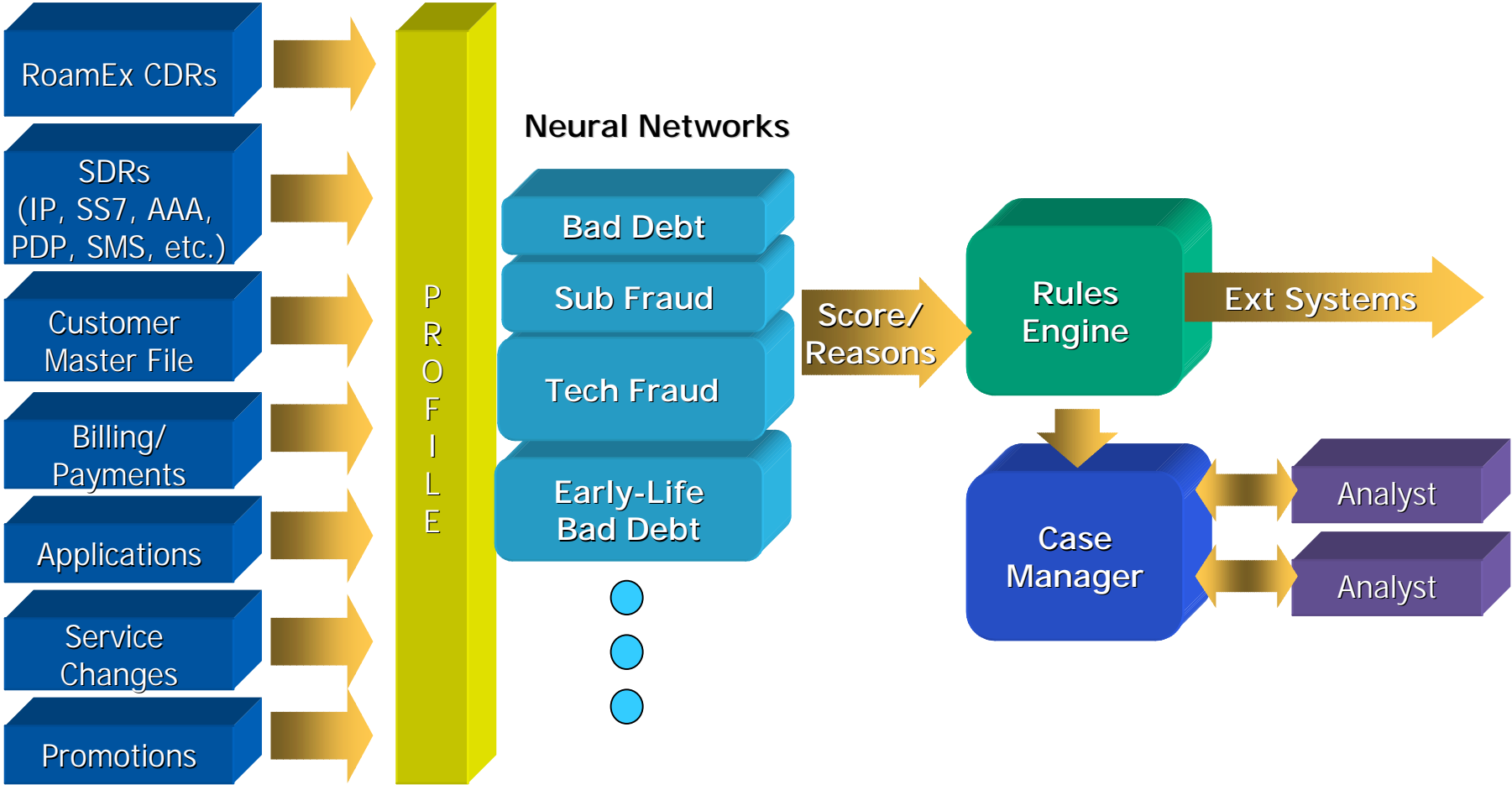
## Baseline RoamEx Call Record - Sample of Fields Available

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- ▶ Mobile subscriber identity number (MIN or IMSI)
- ▶ Mobile directory number
- ▶ Home and Served Switch
- ▶ Handset equipment identity (ESN or IMEI)
- ▶ Initial and final Cell ID / Location Area ID
- ▶ Start of call & end of call date/time
- ▶ Data session time
- ▶ Calling / Dialed digits / IP addresses
- ▶ Call duration / data volume
- ▶ Call direction
- ▶ Call Feature flags

# Next Generation Fraud Detection



**Diagram shows the architecture of Fair Isaac's Risk Manager for Telecommunications**

# Increased Roaming Revenues

- ▶ CTIA 2002: Roaming subscriber averages 4 calls per day, call length 3mins
- ▶ 12 mins airtime per day per roaming subscriber
- ▶ 20% increase in roamer calls from removing calling restrictions (RoamEx allows restrictions to be removed)
- ▶ 2.4 mins extra airtime per day per roaming subscriber
- ▶ ***RoamEx increases inbound and outbound roaming revenues***

Subscriber Base	Roamers	Extra Airtime per Day	Int'l Roaming Rate	Extra \$ per Day
1M	50K	120K	\$1 / min	\$120K
5M	250K	600K	\$1 / min	\$600K
10M	500K	1.2M	\$1 / min	\$1.2M

## RoamEx Benefits Summary

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- ▶ Reduces Fraudulent Usage Detection Time by at least 50%
- ▶ Decreases Fraud Losses by at least 50%
- ▶ Increases Roaming Revenues (inbound and outbound)
  - ▶ Better and more inbound and outbound
  - ▶ Ability to allow more subscribers to roam and with fewer restrictions
- ▶ Reduces Percentage of False Positives Alarms
- ▶ Higher Productivity Rate for Fraud Analysts
- ▶ Provides full visibility into customer's activities
  - ▶ Drives downstream applications