

---

# **NTSMF Goes Simalytic!**

**Demand Technology User Group Meeting**

CMG2001, December 3, 2001

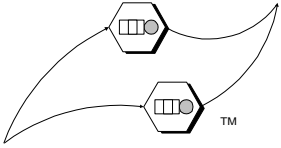
<http://www.simalytic.com/CMG01/NTSMFppt.pdf>

**Dr. Tim R. Norton**  
**Simalytic Solutions, LLC**

719-635-5825

email: [tim.norton@simalytic.com](mailto:tim.norton@simalytic.com)

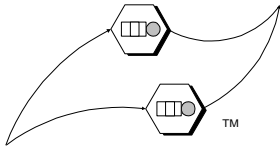
<http://www.simalytic.com>



# Agenda

---

- ◆ **Transaction Modeling**
  - General Discussion
  - What's the Problem?
- ◆ **Leveraging NTSMF Data Collection**
  - Response Time Pipe
  - DevelopNET's PredictNET Service
- ◆ **Questions**

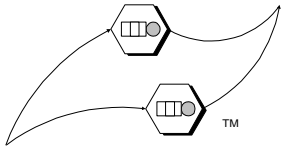


# Transaction Modeling

---

## ◆ What is a Transaction?

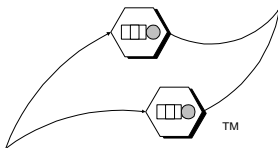
- Recognizable unit of work
  - Measurable resource usage
  - Related to a business function
    - ▲ More than web 'hits' or SQL queries
- Definition dependent on the environment
  - Well defined in some environments
    - ▲ CICS, Tuxedo, Database, Web, Custom client
  - Poorly defined in interactive environments
    - ▲ TSO, DOS, Windows, Unix



# Transaction Measurement

---

- ◆ **Understanding IT Transactions**
  - Functions within a server process
  - Issue: Correlation to external functions
  - Data: NTSMF, PerfMon, SNMP, others...
  
- ◆ **Understanding Business Transactions**
  - Functions meaningful to the Business
  - Issue: Correlation to IT transactions
  - Data: ARM, External measures, others...

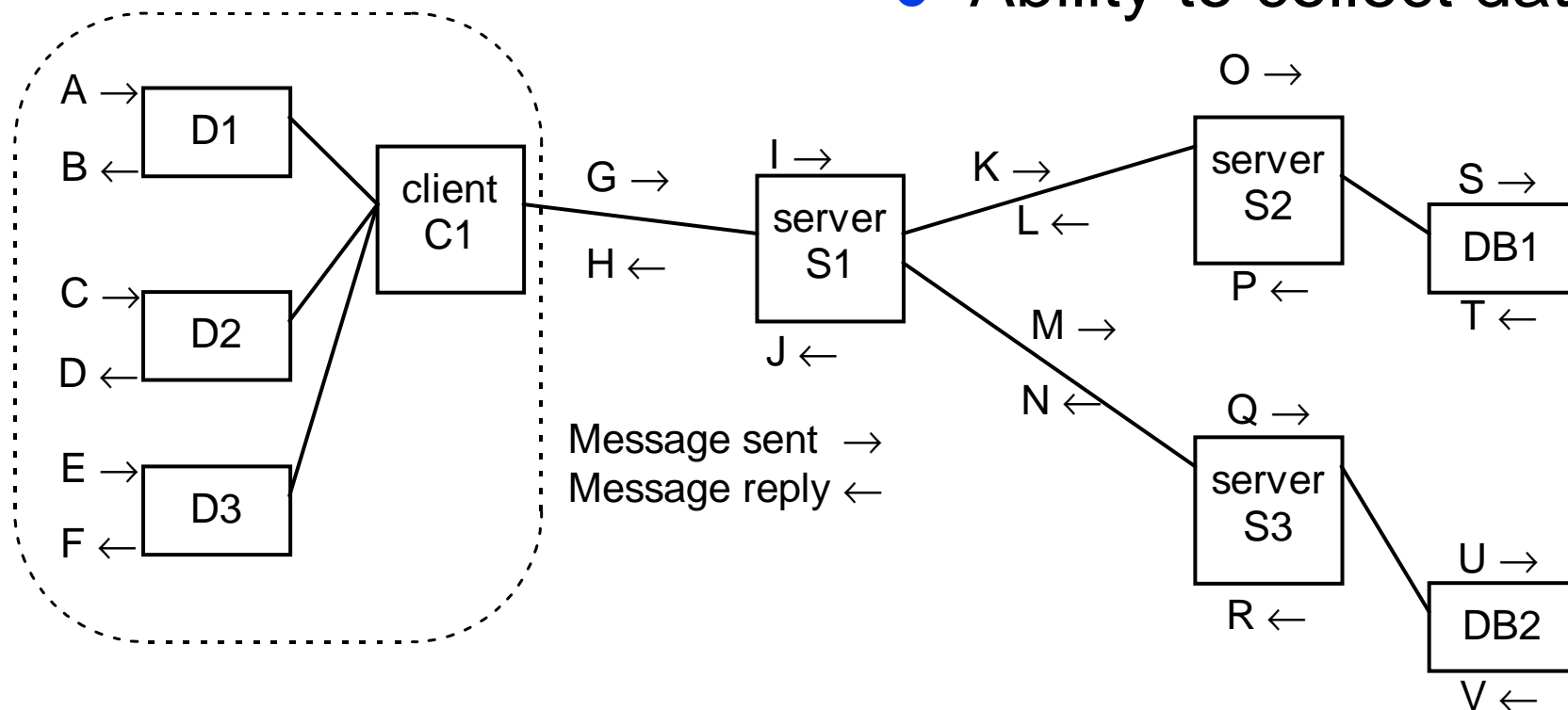


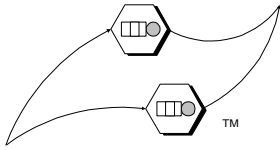
# Transaction Topology

## ◆ Where to Measure? ◆ What to Measure?

- Objective of the measurement

- Ability to “see” events
- Ability to collect data





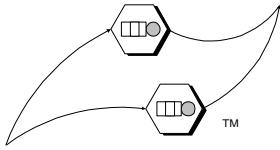
# What's the Problem

---

## ◆ How Does Performance Effect the Business?

- Business result when the application changes?
- Application result when the business changes?
- Implies there is a “good” and a “bad”
  - Assessment of the relationship
  - How to predict when it will become “bad”?

⇒ **How to use performance numbers to answer business (i.e., financial) questions?**

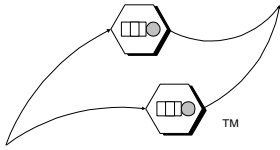


# What's the Problem

---

## ◆ Different types of “Needs”

- Business - Impact to overall process?
- Capacity - What do we have to buy?
- Performance - Is there a cost for failure? (SLAs)
- Design - Will it ever work? (SPE)
- Operations - Impact of management functions?
- Availability - Impact of component failure?



# What's the Problem

---

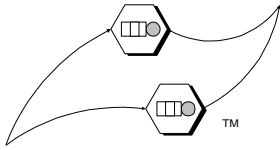
## ◆ Measurement Issues

- What is the end-user's experience?
- Measure everything or just what's "important"?
- Different units of work (transactions, messages, etc.)
- Component response times lack continuity
- End-to-end response times lack enough detail

## ◆ Performance Metrics

- Neither good nor bad
- Relationship to business provides the context

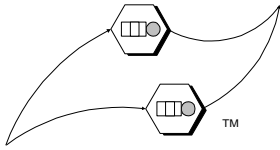




# What's the Solution

---

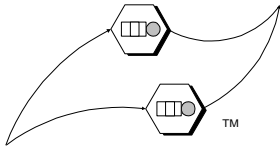
- ◆ **Better Analysis with Less Effort**
  - Use data for multiple purposes
  - Reduce operational effort
  - Connect robust data collection directly to specialized analysis techniques
- ◆ **Leveraging NTSMF Data Collection**
  - Simalytic Solutions' Response Time Pipe
  - DevelopNET's PredictNET Service



# Response Time Pipe

---

- ◆ **What is a Response Time Pipe?**
  - Way to visualize the relationships between components used by an application.
  - A technique that quickly connects different types of component performance measurements or approximations.
  - A technique to relate the performance of the components to the business objective.



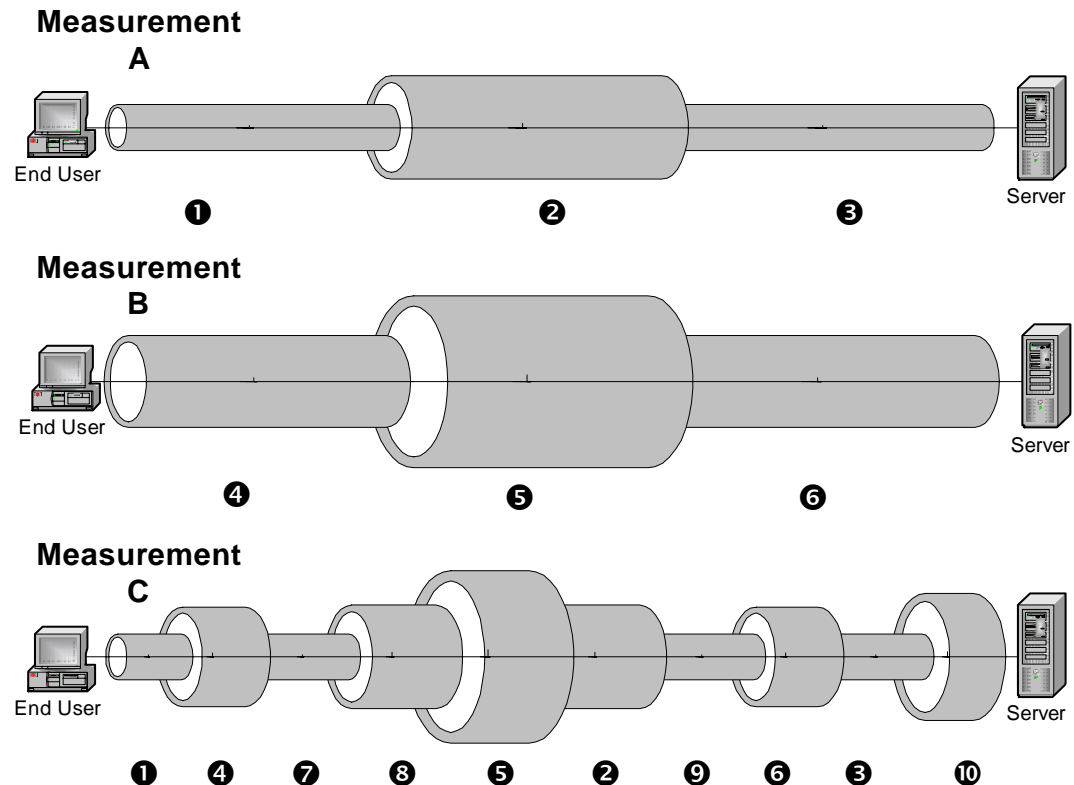
# Response Time Pipe

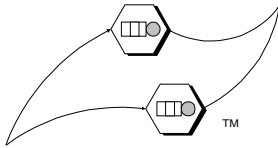
## ◆ Why a Pipe?

- To provide a visual framework that expresses:

- Capacity
- Connection
- Flow
- Sections
- Constrictions

- Looking at different sections provides different perceptions of capacity and performance





# Response Time Pipe Example

## ◆ Compare Response Times:

- Objective
- Actual
- Estimate
- Forecast

## ◆ Conclusions Based on Relationships

## ◆ Explore Component Impacts

RTP Section Utilizations (dynamic page) - Netscape

File Edit View Go Communicator Help

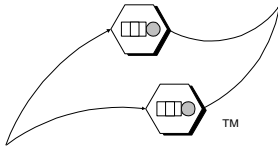
Back Forward Reload Home Search Netscape Print Security Shop Stop

Measurement Interval (minutes): 30  
 Response Times for transaction Create Account:  
 Objective for Overall End-to-end Response Time (seconds): 6  
 RTP Estimate for Overall End-to-end Response Time (seconds): 5.28  
 Actual Measurement of Overall End-to-end Response Time (seconds): 5.5

- 😊 The RTP estimated response time is less than the response time objective, which means it is possible for the transaction to meet the business needs. Additional analysis is needed to understand the effects of queuing and interference from other workloads.
- 😊 The measured response time is greater than the response time estimate, which means the estimate probably reflects the minimal transaction time and the measured time includes queuing and interference from other workloads and the RTP predictive steps can use the estimate for the transaction service time.
- 😊 The measured response time is less than the response time objective, therefore this RTP will probably accept more transaction traffic.

Section Name:	Rep-PC	Call Center LAN	OE Application Server	Colorado LAN	Montana LAN	DB Server
Section Type:	Client	LAN Network	Server	LAN Network	LAN Network	Server
Measurement Type:	Calculation	Sniffer	Server-Monitor	Throughput	Throughput	Delay
Response Time Estimate:	1.53	0.6	1.2	0.25	0.1	1.6
Section Utilization Estimate:	50 %	45 %	65 %	40 %	50 %	n/a %
Section Utilization by Transaction Estimate:	0.22 %	5 %	6.66 %	0.83 %	0.42 %	n/a %

Document: Done



# Response Time Pipe Example

## ◆ Compare Response Times:

- Objective
- Actual
- Estimate
- Forecast

## ◆ Conclusions Based on Relationships

## ◆ Explore Component Impacts

RTP Section Utilizations (dynamic page) - Netscape

File Edit View Go Communicator Help

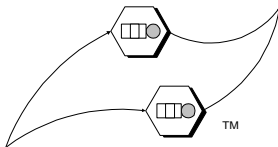
Back Forward Reload Home Search Netscape Print Security Shop Stop

Measurement Interval (minutes): 30  
 Response Times for transaction Create Account:  
 Objective for Overall End-to-end Response Time (seconds): 6  
 RTP Estimate for Overall End-to-end Response Time (seconds): 5.28  
 Actual Measurement of Overall End-to-end Response Time (seconds): 5.5

- ☺ The RTP estimated response time is less than the response time objective, which means it is possible for the transaction to meet the business needs. Additional analysis is needed to understand the effects of queuing and interference from other workloads.
- ☺ The measured response time is greater than the response time estimate, which means the estimate probably reflects the minimal transaction time and the measured time includes queuing and interference from other workloads and the RTP predictive steps can use the estimate for the transaction service time.
- ☺ The measured response time is less than the response time objective, therefore this RTP will probably accept more transaction traffic.

Section Name:	Rep-PC	Call Center LAN	OE Application Server	Colorado LAN	Montana LAN	DB Server
Section Type:	Client	LAN Network	Server	LAN Network	LAN Network	Server
Measurement Type:	Calculation	Sniffer	Server-Monitor	Throughput	Throughput	Delay
Response Time Estimate:	1.53	0.6	1.2	0.25	0.1	1.6
Section Utilization Estimate:	50 %	45 %	65 %	40 %	50 %	n/a %
Section Utilization by Transaction Estimate:	0.22 %	5 %	6.66 %	0.83 %	0.42 %	n/a %

Document: Done



# Response Time Pipe Example

## ◆ Compare Response Times:

- Objective
- Actual
- Estimate
- Forecast

## ◆ Conclusions Based on Relationships

## ◆ Explore Component Impacts

RTP Section Utilizations (dynamic page) - Netscape

File Edit View Go Communicator Help

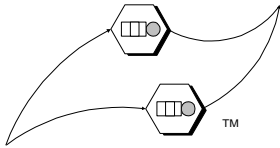
Back Forward Reload Home Search Netscape Print Security Shop Stop

Measurement Interval (minutes): 30  
 Response Times for transaction Create Account:  
 Objective for Overall End-to-end Response Time (seconds): 6  
 RTP Estimate for Overall End-to-end Response Time (seconds): 5.28  
 Actual Measurement of Overall End-to-end Response Time (seconds): 5.5

- 😊 The RTP estimated response time is less than the response time objective, which means it is possible for the transaction to meet the business needs. Additional analysis is needed to understand the effects of queuing and interference from other workloads.
- 😊 The measured response time is greater than the response time estimate, which means the estimate probably reflects the minimal transaction time and the measured time includes queuing and interference from other workloads and the RTP predictive steps can use the estimate for the transaction service time.
- 😊 The measured response time is less than the response time objective, therefore this RTP will probably accept more transaction traffic.

Section Name:	Rep-PC	Call Center LAN	OE Application Server	Colorado LAN	Montana LAN	DB Server
Section Type:	Client	LAN Network	Server	LAN Network	LAN Network	Server
Measurement Type:	Calculation	Sniffer	Server-Monitor	Throughput	Throughput	Delay
Response Time Estimate:	1.53	0.6	1.2	0.25	0.1	1.6
Section Utilization Estimate:	50 %	45 %	65 %	40 %	50 %	n/a %
Section Utilization by Transaction Estimate:	0.22 %	5 %	6.66 %	0.83 %	0.42 %	n/a %

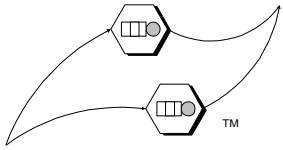
Document: Done



# RTP and NTSMF

---

- ◆ **RTP Provides the Analysis**
- ◆ **NTSMF Provides the Metrics**
  - **Example:**
    - Getting Server CPU metrics for a calculation measurement
    - Hard way:
      - ▲ Requires a custom PerfMon report, special collection process and calculations using `\Process(XXXX)\% Processor Time` for workload processes
    - Easy way:
      - ▲ Summarization report data from NTSMF



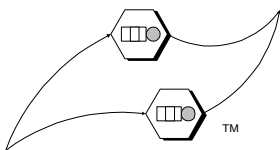
# DevelopNET's PredictNET

---

## ◆ PredictNET Service

- “User view” response time measurements
- Correlations to system resource usage measurements
- Web delivered reports
  - Current assessments (“Health Check”)
  - Forecasts using statistical techniques
  - Predictive models using Simalytic techniques

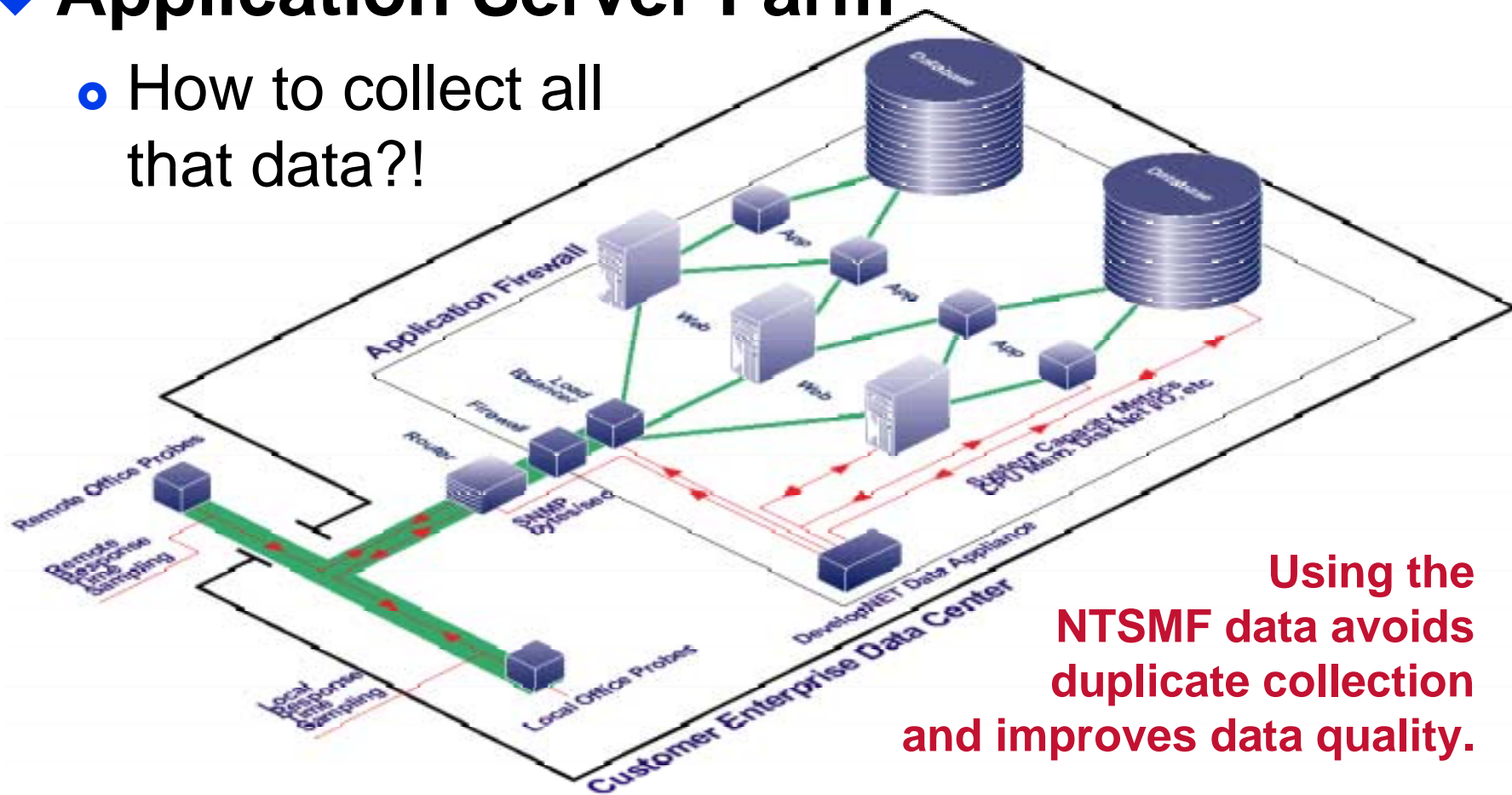




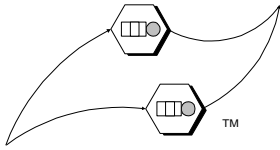
# DevelopNET's PredictNET

## ◆ Application Server Farm

- How to collect all that data?!



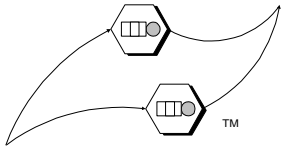
**Using the  
NTSMF data avoids  
duplicate collection  
and improves data quality.**



# PredictNET Data Collection

---

- ◆ **System Level Resource Measurement**
  - Low impact sampling methodology
  - Adaptive technique to further reduce overhead
- ◆ **External Response Time Sampling**
  - Workload characterization through browser interface enables ‘workload targeting’

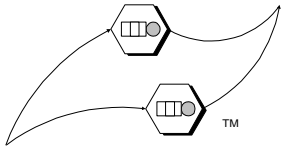


# PredictNET Data Collection

---

## ◆ Meta-Collection:

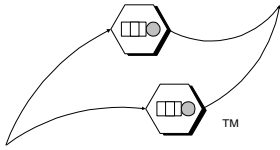
- Integrate with existing data collection and management frameworks
  - **Demand Technology NTSMF**, BMC Patrol, NetIQ
- Import third party transaction data
  - Keynote
- Import traffic data for workload characterization



# PredictNET Analysis

---

- ◆ **Data Conversion & Reduction**
  - SmartMetrics data reduction techniques
  - Principal components and factor analysis
  - Normalize, clean and store in metric warehouse
  - Utilize existing NTSMF metric warehouse
- ◆ **Statistical**
  - Regressive and auto-regressive constructs
  - Linear and nonlinear, multi-variate regression



# PredictNET Analysis

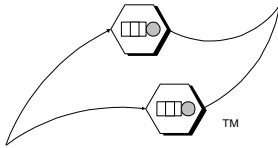
---

## ◆ Correlation

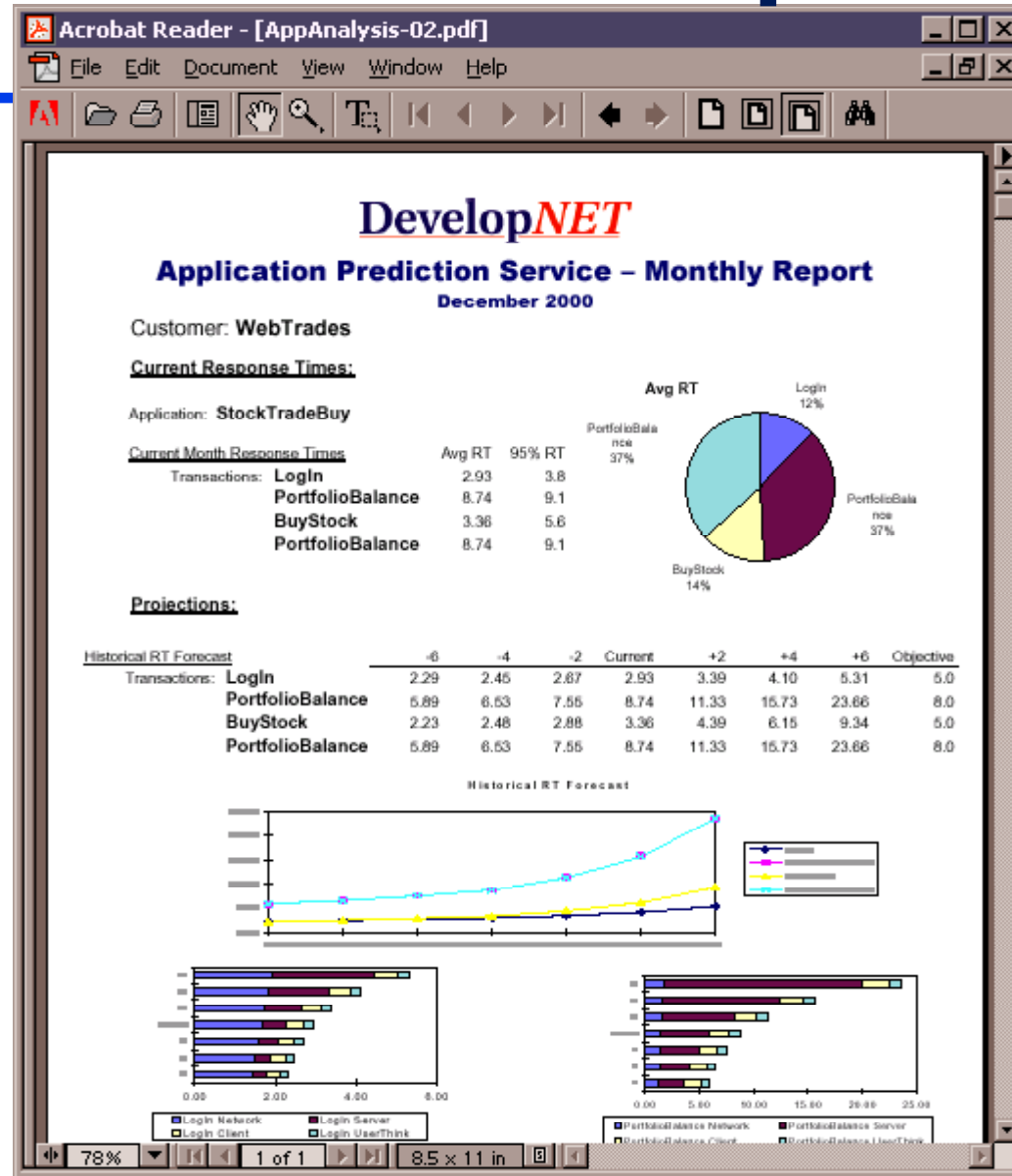
- Connects response times with resource usage
- Direct measurements NOT required
- Identifies resources that actually impact users

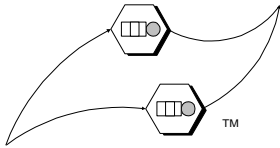
## ◆ Forecasting and Prediction

- Multiple techniques:
  - Statistical, Analytic, Simalytic Modeling
- Appropriate technique = fast, usable results



# PredictNET Sample Report

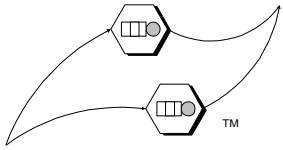




# DevelopNET and NTSMF

---

- ◆ **PredictNET Provides the Analysis**
- ◆ **NTSMF Provides the Metrics**
  - **Example:**
    - Getting NT IIS Web Server metrics
    - Default collector:
      - ▲ Coarse-Granular measurements
      - ▲ Not usable for other analysis
    - NTSMF collector :
      - ▲ Fine-Granular measurements
      - ▲ Wide variety of generalized reporting also available
      - ▲ Automatically imported without additional server overhead

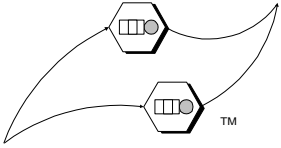


# What's Next?

---

- ◆ **After You Have the Data...**
  - Relate it to the Business
  - Predict future performance
  - Anticipate capacity needs





---

# Questions?

**End-To-End Scaling and The Response Time Pipe are service marks of Simalytic Solutions, LLC.  
PredictNET and SmartMetrics are trademarks and/or service marks of DevelopNET Corporation.  
All other trademarked names and terms are the property of their respective owners.**