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JUDUL: THE DEVELOPMENT OF METRICA/NPR 3.3

SESI PENGAJIAN: 2004 / 2005

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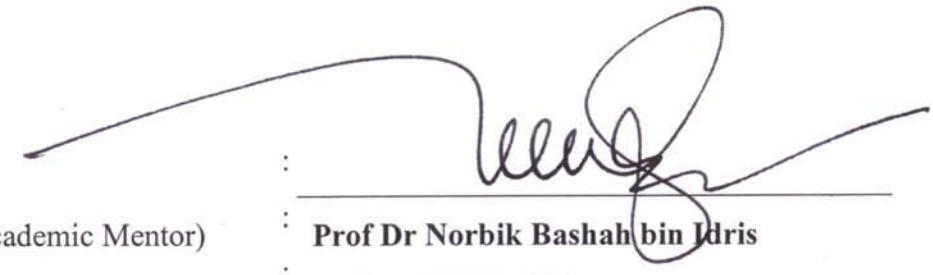
Signature : 

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Supervisor II (Industrial Mentor) : **Mr. Antti Johansson**

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THE DEVELOPMENT OF METRICA/NPR 3.3

MOHD FARID ISMAIL

A technical report submitted in partial fulfillment
of the requirements for the award of the degree of
Masters of Science (Computer Science - Real Time Software Engineering)

Faculty of Computer Science and Information Systems
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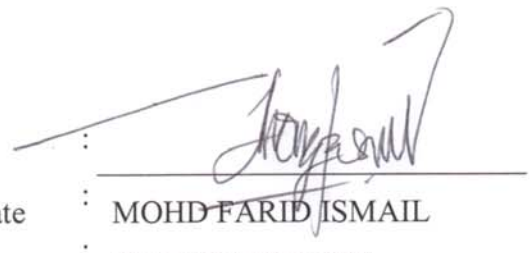
October 2004

I declare that this technical report entitled "The Development of Metrica/NPR 3.3" is the result of my own research except as cited in references. This project report has not been accepted for any degree and is not concurrently submitted in candidature of any other degree.

Signature : 

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To my beloved mother, father, wife and daughters.

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ABSTRACT

Examining performance data over time can help operators identify underlying trends that would go unnoticed if the data was merely looked at in real time, then discarded. Network performance reporting management can lead to a more proactive style of network management. Metrica/NPR is a Network Performance Reporting application that provides network operators an integrated view of the performance of telecommunications networks for various technology including wireless, wireline and Internet Protocol (IP). Metrica/NPR helps operators improve their understanding of network behavior by managing, analyzing and reporting, performance statistics generated by the network. Metrica/NPR 3.3 is the latest release of Metrica/NPR product line produced by ADC in order to adopt the challenge of a continuously changing network environment. It is a significant release, which is for the first time being developed from ADC research and development (R&D) center in Kuala Lumpur. ADC Software Systems is an ISO9001:2000 certified company since June 1998 for its management system in product development and deployment. Quality management system, now called as business management system (BMS), is the primary process reference in product development. The development of Metrica/NPR 3.3 explores the internal part of ADC development process involved in producing a great software product, focusing on coding and testing, based on BMS. Besides the requirement of high set of programming technique and deep exploration on different operating system environment, this technical report explains the details aspect of the software development activities such as coding, testing, project management and configuration management.

ABSTRAK

Pemeriksaan data prestasi berdasarkan masa dapat membantu operator rangkaian mengenalpasti corak asas penggunaan rangkaian yang mungkin tidak dapat dilihat melalui data masa nyata yang sentiasa berubah. Pengurusan laporan prestasi rangkaian membolehkan tindakan yang lebih pro-aktif diambil dalam menguruskan rangkaian. Metrica/NPR merupakan aplikasi pelaporan prestasi rangkaian yang menyediakan gambaran bersepadu tentang prestasi sesebuah rangkaian telekomunikasi yang berasaskan pelbagai teknologi termasuk rangkaian tanpa wayar, rangkaian wayar dan protokol internet (IP) kepada operator rangkaian. Metrica/NPR membantu operator memperbaiki kefahaman mereka tentang gelagat rangkaian dengan mengurus, menganalisa dan melaporkan, statistik prestasi yang dijana oleh rangkaian. Metrica/NPR 3.3 merupakan versi terkini Metrica/NPR yang dibangunkan oleh ADC bagi memenuhi cabaran persekitaran rangkaian yang sentiasa berubah. Ia adalah versi yang mengandungi perubahan nyata dan pertama kali dibangunkan di pusat penyelidikan dan pembangunan (R&D) ADC di Kuala Lumpur. ADC Software Systems merupakan syarikat yang dianugerahkan sijil ISO9001:2000 sejak Jun 1998 untuk sistem pengurusannya dalam pembangunan dan pengaturan sistem. Sistem pengurusan kualiti, atau kini dipanggil sebagai sistem pengurusan perniagaan (BMS), adalah rujukan proses utama dalam pembangunan produk. Pembangunan Metrica/NPR 3.3 meneroka sudut dalaman proses pembangunan sistem yang diamalkan oleh ADC dalam menghasilkan produk perisian yang hebat, dengan fokus terhadap pengaturcaraan dan pengujian, berdasarkan BMS. Disamping keperluan terhadap kepakaran yang tinggi dalam teknik pengaturcaraan serta penerokaan mendalam terhadap persekiratan sistem operasi, laporan teknikal ini menerangkan dengan lebih terperinci aspek aktiviti-aktiviti pembangunan perisian seperti pengaturcaraan, pengujian, pengurusan projek dan pengurusan konfigurasi.

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LIST OF ACRONYMS

ACRONYM	DESCRIPTION
4GL	4th Generation Language
API	Application Programming Interface
BH	Busy Hour
CASE	Center for Advanced Software Engineering
CM	Configuration Management
CPU	Central Processing Unit
CR	Change Request
CSV	Comma Separated Value
GB	Gigabyte
GPRS	General Packet Radio Service
GSM	Global System for Mobile communication
GUI	Graphical User Interface
ICMP	Internet Control Message Protocol
IP	Internet Protocol
ISO	International Organization for Standardization
KL	Kuala Lumpur
NPR	Network Performance Reporting
NSL	Native Language Support
PC	Personal Computer
QoS	Quality of Service
R&D	Research and Development
SDH	Synchronous Digital Hierarchy
SDK	Software Development Kit
SL	Signaling Link
TSL	Technical Scripting Language

UK	United Kingdom
UTM	Universiti Teknologi Malaysia
USA	United States of America
V&R	Validation and Release

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CHAPTER 1

INTRODUCTION

1.1 Project Overview

Metrica/NPR is a Network Performance Reporting application that provides network operators with an integrated view of the performance of telecommunications networks for wireless and wireline technology including Internet Protocol (IP). Metrica/NPR helps operators improve their understanding of network behavior by managing, analyzing, and reporting performance statistics generated by the network. The functionality covers network planning, operations, engineering and traffic management capabilities.

Metrica/NPR collects performance data, calculates key performance indicators, detects specific conditions in the network, and generates and displays reports. It has four key design goals:

(i) Fast, interactive access to data.

Operators quickly sort through the vast amount of performance data – potentially hundreds of megabytes a day – using simple, intuitive reporting applications. Reports and graphs provide specific information network operators require through X-Motif or Web GUI.

(ii) Vendor independence.

Metrica/NPR provides information of the entire network – not just on specific elements – regardless of the type of equipment deployed. Differences in how vendors report performance information are

managed by the software to give operators a single, consistent view of their network. It provides solution for multi-vendor and also best suited for multi-technology or multi-domain environment.

(iii) Extensibility.

It comes with pre-defined reports and graphs and operators can easily customize and support new raw measurements, network elements, performance indicators and reporting requirements.

(iv) Rapid deployment and easy administration.

The system installs quickly regardless of network vendor (Ericsson, Motorola, Nokia, Alcatel, Nortel, Cisco etc) or technology (GSM, GPRS, IP etc.) Once installed, system administrators manage the system through a single module with easy-to-use graphical usert interface (GUI). In addition, Metrica/NPR offers the Performance Alarm Server, which automatically performs many common system-monitoring tasks.

1.2 Organizational Background

ADC delivers solutions of network equipment, fiber optics, software and systems integration services to enable communications service providers to deliver highspeed Internet, data, video and voice services to consumers and businesses worldwide. ADC (Nasdaq: ADCT) has operations in nearly 100 countries and is included in the Standard & Poor 500 Index and the Nasdaq 100 Index. Its customers are local and long-distance telephone companies, cable television operators, wireless service providers, new competitive service providers, broadcasters, enterprises, governments, and communications equipment distributors.

ADC works with leading service providers around the world to deliver comprehensive, reliable and flexible Metrica service assurance solutions. Metrica

provides seamless support for wireline and mobile services, circuit and packet technologies, today’s services and tomorrow’s.

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