
ABSTRAK

Dewasa ini sistem berbasis jaringan komputer memegang peranan penting dalam berbagai bidang, diantaranya dalam bidang pendidikan ataupun bisnis. Sering kali sistem jaringan komputer yang ada menjadi sedemikian rumit sehingga apabila terjadi kerusakan, seorang *administrator* harus bekerja keras mencari kerusakan tersebut.

Tujuan Tugas Akhir ini untuk mengembangkan suatu aplikasi yang dapat membantu mempermudah diagnosa kerusakan maupun masalah yang terjadi pada jaringan komputer dan dapat membantu seorang *administrator* menguji berbagai aspek dalam suatu jaringan, misalnya *firewall* atau *DNS server*-nya. Adapun fitur yang dianalisa adalah *ping*, *ping sweep*, *port scanner*, *DNS resolver*, *MAC address resolver*, dan *system information*. Aplikasi dibuat dengan menggunakan bahasa *C#*, dengan menggunakan alat bantu *Microsoft Visual Studio .NET*.

Dari hasil pengujian yang dilakukan, tingkat akurasi maupun performa aplikasi dapat dikatakan sangat baik dan dapat diandalkan. Kerusakan kabel pada simulasi performa dapat ditemukan dalam waktu 2 menit saja.

ABSTRACT

Nowadays computer network system plays important role in many aspect, such as education or business. Sometimes, network system can be very complicated so if a problem occurs, a hard job must be taken by an administrator to track and repair the problem.

The aim of this final project is to develop a software that can help in tracing and diagnosing problems and errors that occur in a network system and help network administrators to test many aspect in their network, such as firewall or DNS Server. Features to be analyzed are ping, ping sweep, port scanner, DNS resolver, MAC address resolver, and system information. The software is built using C# language, with Microsoft Visual Studio .NET as the tool.

System testing shows that this software has a good accuracy in result and good performance, so this software is reliable. A cable error in performance simulation can be found just in 2 minutes.

Daftar Isi

ABSTRAK	i
ABSTRACT	ii
KATA PENGANTAR.....	iii
UCAPAN TERIMA KASIH	iv
Daftar Isi	v
Daftar Gambar	vi
Daftar Tabel	vi
BAB I PERSYARATAN PRODUK	1
1.1 Pendahuluan.....	1
1.1.1 Tujuan	1
1.1.2 Ruang Lingkup Proyek	1
1.1.3 Definisi, Akronim, dan Singkatan	1
1.1.4 Referensi	2
1.1.5 Sistematika Penulisan	3
1.2 Persyaratan Produk	4
1.2.1 Gambaran Keseluruhan.....	4
1.2.1.1 Perspektif Produk.....	4
1.2.1.2 Antarmuka Sistem	4
1.2.1.3 Antarmuka Pengguna	4
1.2.1.4 Antarmuka Perangkat Keras.....	5
1.2.1.5 Antarmuka Perangkat Lunak	5
1.2.1.6 Antarmuka Komunikasi.....	5
1.2.1.7 Batasan Memori.....	6
1.2.1.8 Persyaratan Adaptasi Pada Tempat Tujuan.....	6
1.2.2 Fungsi Produk.....	6
1.2.3 Karakteristik Pengguna	6
1.2.4 Batasan-batasan	6
1.2.5 Asumsi dan Ketergantungan.....	7
1.2.6 Penundaan Persyaratan	7
BAB II SPESIFIKASI PRODUK	8
2.1 Persyaratan Antarmuka Eksternal.....	8
2.1.1 Antarmuka Dengan Pengguna.....	8
2.1.2 Antarmuka Perangkat Keras	8
2.1.3 Antarmuka Perangkat Lunak.....	8
2.1.4 Antarmuka Komunikasi	9
2.2 Fitur Produk Perangkat Lunak	9
2.2.1 Fitur “Ping”.....	9
2.2.1.1 Tujuan	9
2.2.1.2 Urutan Stimulus/Respon	10
2.2.1.3 Persyaratan Fungsional yang Berhubungan	11
2.2.1.3.1 XP Common Control	11
2.2.1.3.2 Pendahuluan.....	11
2.2.1.3.2.1 Masukan	12
2.2.1.3.2.2 Pemrosesan.....	12
2.2.1.3.2.3 Keluaran	12
2.2.1.3.3 ZedGraph.....	12

2.2.1.3.3.1	Pendahuluan.....	12
2.2.1.3.3.2	Masukan	12
2.2.1.3.3.3	Pemrosesan.....	13
2.2.1.3.3.4	Keluaran	13
2.2.1.3.4	Ping Library	13
2.2.1.3.4.1	Pendahuluan.....	13
2.2.1.3.4.2	Masukan	13
2.2.1.3.4.3	Pemrosesan.....	13
2.2.1.3.4.4	Keluaran	13
2.2.1.3.5	Logging.....	14
2.2.1.3.5.1	Pendahuluan.....	14
2.2.1.3.5.2	Masukan	14
2.2.1.3.5.3	Pemrosesan.....	14
2.2.1.3.5.4	Keluaran	14
2.2.2	Fitur "Ping Sweep"	14
2.2.2.1	Tujuan	15
2.2.2.2	Urutan Stimulus/Respon	15
2.2.2.3	Persyaratan Fungsional yang Berhubungan	16
2.2.2.3.1	Ping Library	16
2.2.2.3.2	XP Common Control	17
2.2.2.3.3	MooseNet Library	17
2.2.2.3.3.1	Pendahuluan.....	17
2.2.2.3.3.2	Masukan	17
2.2.2.3.3.3	Pemrosesan.....	17
2.2.2.3.3.4	Keluaran	18
2.2.2.3.4	IP Address Control Library	18
2.2.2.3.4.1	Pendahuluan.....	18
2.2.2.3.4.2	Masukan	18
2.2.2.3.4.3	Pemrosesan.....	18
2.2.2.3.4.4	Keluaran	19
2.2.2.3.5	Lumisoft Net Library	19
2.2.2.3.5.1	Pendahuluan.....	19
2.2.2.3.5.2	Masukan	19
2.2.2.3.5.3	Pemrosesan.....	20
2.2.2.3.5.4	Keluaran	20
2.2.2.3.6	Logging.....	20
2.2.3	Fitur "TCP Port Scanner"	20
2.2.3.1	Tujuan	20
2.2.3.2	Urutan Stimulus/Respon	20
2.2.3.3	Persyaratan Fungsional yang Berhubungan	22
2.2.3.3.1	Ping Library	22
2.2.3.3.2	XP Common Control	22
2.2.3.3.3	Logging.....	22
2.2.4	Fitur "DNS Resolver"	22
2.2.4.1	Tujuan	23
2.2.4.2	Urutan Stimulus/Respon	23
2.2.4.3	Persyaratan Fungsional yang Berhubungan	24
2.2.4.3.1	Lumisoft Net Library	24

2.2.4.3.2	MooseNet Library	25
2.2.4.3.3	XP Common Control	25
2.2.4.3.4	Logging.....	25
2.2.5	Fitur "MAC Address Resolver"	25
2.2.5.1	Tujuan	25
2.2.5.2	Urutan Stimulus/Respon	25
2.2.5.3	Persyaratan Fungsional yang Berhubungan	26
2.2.5.3.1	IP Address Control Library	27
2.2.5.3.2	MAC Enumeration Library	27
2.2.5.3.2.1	Pendahuluan.....	27
2.2.5.3.2.2	Masukan	27
2.2.5.3.2.3	Pemrosesan.....	27
2.2.5.3.2.4	Keluaran	27
2.2.5.3.3	Active Directory Enumeration Library	27
2.2.5.3.3.1	Pendahuluan.....	28
2.2.5.3.3.2	Masukan	28
2.2.5.3.3.3	Pemrosesan.....	28
2.2.5.3.3.4	Keluaran	28
2.2.5.3.4	XP Common Control	28
2.2.5.3.5	Logging.....	28
2.2.6	Fitur "Remote System Information"	28
2.2.6.1	Tujuan	29
2.2.6.2	Urutan Stimulus/Respon	29
2.2.6.3	Persyaratan Fungsional yang Berhubungan	30
2.2.6.3.1	Remote SysInfo	30
2.2.6.3.1.1	Pendahuluan.....	30
2.2.6.3.1.2	Masukan	31
2.2.6.3.1.3	Pemrosesan.....	31
2.2.6.3.1.4	Keluaran	31
2.2.6.3.2	XP Common Control	31
2.2.6.3.3	Logging.....	31
2.2.7	Fitur "System Information"	31
2.2.7.1	Tujuan	32
2.2.7.2	Urutan Stimulus/Respon	32
2.2.7.3	Persyaratan Fungsional yang Berhubungan	33
2.2.7.3.1	Remote SysInfo	33
2.2.7.3.2	XP Common Control	33
2.3	Persyaratan Performa	33
2.4	Batasan Desain	34
2.5	Atribut-atribut Sistem Perangkat Lunak.....	34
2.5.1	Kehandalan	34
2.5.2	Ketersediaan	35
2.5.3	Keamanan.....	35
2.5.4	Pemeliharaan.....	35
2.5.5	Perpindahan (Portability).....	35
BAB III	ANALISA DAN DESAIN.....	36
3.1	Analisa.....	36
3.1.1	Analisa Tujuan Perancangan Aplikasi	36

3.1.2	Analisa Pengguna	36
3.2	Desain	36
3.2.1	Desain Aplikasi Secara Umum	36
3.2.1.1	User Interface	37
3.2.1.2	Bahasa Pemograman	37
3.2.2	Use-case Diagram	38
3.2.3	Sequence Diagram	38
3.2.3.1	Sequence Diagram "Ping a Host"	39
3.2.3.2	Sequence Diagram "Ping Multiple Hosts"	40
3.2.3.3	Sequence Diagram "Scan Ports"	41
3.2.3.4	Sequence Diagram "Resolve MAC Addresses"	42
3.2.3.5	Sequence Diagram "Resolve DNS"	43
3.2.3.6	Sequence Diagram "View System Info"	44
3.2.3.7	Sequence Diagram "View System Info on a Remote Host"	45
3.2.3.8	Sequence Diagram "View and Delete Log"	46
3.2.4	Activity Diagram	46
3.2.4.1	Activity Diagram "Ping a Host"	47
3.2.4.2	Activity Diagram "Ping Multiple Hosts"	48
3.2.4.3	Activity Diagram "Scan Ports"	49
3.2.4.4	Activity Diagram "Resolve MAC Addresses"	50
3.2.4.4.1	Activity Diagram "Resolve MAC Addresses" from a Single Host	51
3.2.4.4.2	Activity Diagram "Resolve MAC Addresses" of Nodes in a Workgroup	52
3.2.4.4.3	Activity Diagram "Resolve MAC Addresses" of Nodes in a Domain	53
3.2.4.5	Activity Diagram Modul "Resolve DNS"	54
3.2.4.6	Activity Diagram "View System Info"	55
3.2.4.7	Activity Diagram "View System Info on a Remote Host"	56
3.2.4.8	Activity Diagram "View and Delete Log"	57
3.2.5	Class Diagram	58
3.2.5.1	Internal Class	58
3.2.5.1.1	Class Diagram Modul "Ping"	59
3.2.5.1.2	Class Diagram Modul "Ping Sweep"	59
3.2.5.1.3	Class Diagram Modul "TCP Port Scanner"	60
3.2.5.1.4	Class Diagram Modul "MAC Address Resolver"	60
3.2.5.1.5	Class Diagram Modul "DNS Resolver"	60
3.2.5.1.6	Class Diagram Modul "System Information"	61
3.2.5.1.7	Class Diagram Modul "Remote SysInfo"	61
3.2.5.1.8	Class Diagram Modul "Log Viewer"	61
3.2.5.1.9	Class Diagram "Logging"	61
3.2.5.2	External Class	62
3.2.5.3	Class Diagram Beserta Relasinya	62
3.2.5.3.1	Class Diagram Modul Ping Beserta Relasinya	64
3.2.5.3.2	Class Diagram Modul Ping Sweep Beserta Relasinya	64
3.2.5.3.3	Class Diagram Modul DNS Resolver Beserta Relasinya	65
3.2.5.3.4	Class Diagram Modul MAC Address Resolver Beserta Relasinya	65
3.2.5.3.5	Class Diagram Modul TCP Port Scanner Beserta Relasinya	66
3.2.5.3.6	Class Diagram Modul Remote System Information Beserta Relasinya	66
3.2.5.3.7	Class Diagram Modul System Information Beserta Relasinya	66
3.2.6	Desain Gui	67

BAB IV PERANCANGAN SISTEM	68
4.1 Realisasi <i>Layout</i> Aplikasi	68
4.2 Interface Fitur "System Information"	69
4.3 Interface Fitur "Ping"	70
4.4 Interface Fitur "Ping Sweep"	75
4.5 Interface Fitur "DNS Resolver"	81
4.6 Interface Fitur "MAC Address Resolver"	88
4.7 Interface Fitur "Remote System Information"	95
4.8 Interface Fitur "TCP Port Scanner"	98
4.9 Interface Fitur "Log Viewer"	103
BAB V TESTING DAN EVALUASI SISTEM	107
5.1 Rencana Pengujian Sistem Terimplementasi	107
5.1.1 Test Case	107
5.1.1.1 Graphical User Interface / User Interface Test	108
5.1.1.2 "System Information" Module Test	109
5.1.1.3 "Ping" Module Test	110
5.1.1.4 "Ping Sweep" Module Test	113
5.1.1.5 "TCP Port Scanner" Module Test	114
5.1.1.6 "DNS Resolver" Module Test	115
5.1.1.7 "MAC Address Resolver" Module Test	119
5.1.1.8 "Remote System Information" Module Test	120
5.1.1.9 "Log Viewer" Module Test	120
5.2 Kesalahan yang Ditemukan dan Perbaikannya	121
5.2.1 Graphical User Interface / User Interface	121
5.2.2 "System Information" Module	122
5.2.3 "Ping" Module	124
5.2.4 "Ping Sweep" Module	124
5.2.5 "TCP Port Scanner" Module	124
5.2.6 "DNS Resolver" Module	124
5.2.7 "MAC Address Resolver" Module	124
5.2.8 "Remote System Information" Module	125
5.2.9 "Log Viewer" Module	125
5.3 Ulasan Hasil Evaluasi	125
BAB VI KESIMPULAN DAN SARAN	126
6.1 Kesimpulan	126
6.2 Saran	126

Daftar Gambar

Gambar 1.	Contoh hasil keluaran fitur "Ping"	11
Gambar 2.	Contoh hasil keluaran fitur "Ping Sweep"	16
Gambar 3.	Contoh tampilan fitur "TCP Port Scanner"	22
Gambar 4.	Contoh tampilan dari fitur "DNS Resolver"	24
Gambar 5.	Contoh tampilan dari fitur "MAC Address Resolver"	26
Gambar 8.	Use Case Diagram Network Engineer's Toolset	38
Gambar 9.	Sequence Diagram "Ping a Host"	39
Gambar 10.	Sequence Diagram "Ping Multiple Hosts"	40
Gambar 11.	Sequence Diagram "Scan Ports"	41
Gambar 12.	Sequence Diagram "Resolve MAC Addresses"	42
Gambar 13.	Sequence Diagram "Resolve DNS"	43
Gambar 14.	Sequence Diagram "View System Info"	44
Gambar 15.	Sequence Diagram "View Remote System Info on a Remote Host"	45
Gambar 16.	Sequence Diagram "View and Delete Log"	46
Gambar 17.	Activity Diagram "Ping a Host"	47
Gambar 18.	Activity Diagram "Ping Multiple Hosts"	48
Gambar 19.	Activity Diagram "Scan Ports"	49
Gambar 20.	Activity Diagram "Resolve MAC Addresses"	50
Gambar 21.	Activity Diagram "Resolve MAC Address" from a Single Host	51
Gambar 22.	Activity Diagram "Resolve MAC Addresses" of Nodes in a Workgroup	52
Gambar 23.	Activity Diagram "Resolve MAC Addresses" of Nodes in a Domain	53
Gambar 24.	Activity Diagram "Resolve DNS"	54
Gambar 25.	Activity Diagram "View System Info"	55
Gambar 26.	Activity Diagram "View System Info on a Remote Host"	56
Gambar 27.	Activity diagram "View and Delete Log"	57
Gambar 28.	Internal Class Pada NETS	58
Gambar 29.	Class Diagram Modul Ping	59
Gambar 30.	Class Diagram Modul "Ping Sweep"	59
Gambar 31.	Class Diagram Modul TCP Port Scanner	60
Gambar 32.	Class Diagram Modul "MAC Address Resolver"	60
Gambar 33.	Class Diagram modul "DNS Resolver"	60
Gambar 34.	Class Diagram Modul "System Information"	61
Gambar 35.	Class Diagram Modul "Remote SysInfo"	61
Gambar 36.	Class Diagram Modul "Log Viewer"	61
Gambar 37.	Class Diagram "Logging"	61
Gambar 38.	External Class pada NETS	62
Gambar 39.	Class Diagram Beserta Relasinya	63
Gambar 40.	Class Diagram Modul "Ping" Beserta Relasinya	64
Gambar 41.	Class Diagram Modul "Ping Sweep" Beserta Relasinya	64
Gambar 42.	Class Diagram Modul "DNS Resolver" Beserta Relasinya	65
Gambar 43.	Class Diagram Modul "MAC Address Resolver" Beserta Relasinya	65
Gambar 44.	Class Diagram Modul "TCP Port Scanner" Beserta Relasinya	66
Gambar 45.	Class Diagram Modul "Remote System Information" Beserta Relasinya	66

Gambar 46.	Class Diagram Modul "System Information" Beserta Relasinya	66
Gambar 47.	User Interface NETS	67
Gambar 48.	Tampilan utama Aplikasi	68
Gambar 49.	Tampilan dari "NIC Info"	69
Gambar 50.	Tampilan form "About"	69
Gambar 51.	Tampilan fitur "Ping" ketika pertama kali dijalankan	70
Gambar 52.	Tampilan Fitur "Ping" Setelah melakukan ping pada sebuah host	75
Gambar 53.	Opsi-Opsi pada fitur "Ping Sweep"	75
Gambar 54.	Fungsi DNS Resolving pada fitur "Ping Sweep"	76
Gambar 55.	Tampilan Fitur "Ping Sweep" ketika pertama kali dijalankan	76
Gambar 56.	Tampilan fitur "Ping Sweep" setelah selesai melakukan scanning.	81
Gambar 57.	Opsi "input" pada fitur DNS Resolver	81
Gambar 58.	Query type pada fitur DNS Resolver	82
Gambar 59.	Tampilan Fitur "DNS Resolver" ketika pertama kali dijalankan	82
Gambar 60.	Tampilan Fitur "DNS Resolver" setelah selesai melakukan Query bertipe MX.....	87
Gambar 61.	Tampilan Fitur "DNS Resolver" setelah selesai melakukan Query bertipe A	88
Gambar 62.	Opsi dari fitur "MAC Address Resolver"	88
Gambar 63.	Fitur "MAC Address Resolver" ketika dijalankan.	89
Gambar 64.	Hasil dari fitur "MAC Address Resolver".	94
Gambar 65.	Opsi pada fitur "Remote System Information"	95
Gambar 66.	Jendela fitur "Remote System Information" ketika dijalankan.	95
Gambar 67.	Hasil dari Fitur Remote System Information.	97
Gambar 68.	Opsi-opsi Fitur "TCP Port Scanner".	98
Gambar 69.	Opsi tambahan fitur TCP Port Scanner.	98
Gambar 70.	Jendela Fitur "TCP Port Scanner" ketika dijalankan.	99
Gambar 71.	Message box yang tampil jika ping probe tidak berhasil	100
Gambar 72.	Hasil scan Fitur TCP Port Scanner.	103
Gambar 73.	Opsi pada fitur "Log Viewer"	103
Gambar 74.	Drop down list yang berisi pilihan log.....	104
Gambar 75.	Jendela Fitur "Log Viewer" pada saat dijalankan.....	104
Gambar 76.	Sebuah log dari Fitur DNS Resolver.	106
Gambar 77.	Skema Jaringan Komputer yang digunakan untuk pengujian	111
Gambar 78.	Kesalahan pada modul "System Information"	123

Daftar Tabel

Tabel 1.	Test Case Graphical User Interface / User Interface	108
Tabel 2.	Test Case modul "System Information"	109
Tabel 3.	Test Case modul "Ping"	111
Tabel 4.	Pengujian engine "ping"	112
Tabel 5.	Test case fitur "Ping Sweep"	113
Tabel 6.	Test Case fitur "Port Scanner"	114
Tabel 7.	Test Case modul "DNS Resolver"	115
Tabel 8.	Pengujian Engine "DNS Resolver"	118
Tabel 9.	Test case modul "MAC Address Resolver"	119
Tabel 10.	Test case fitur "Remote System Information"	120
Tabel 11.	Test case modul Log Viewer	121