



Welcome

Mr. Ken Swarner



# Preliminary Design Presentation

December 5, 2003

Mirage Incorporated

Presented by:

Lauren Englisbe, Introduction and Conclusion

Jayme Gresen, Prototype Overview

Richard Connell, Data Structures



# Mirage Incorporated

Paul Aiuto, Systems Administrator

Richard Connell, Webmaster

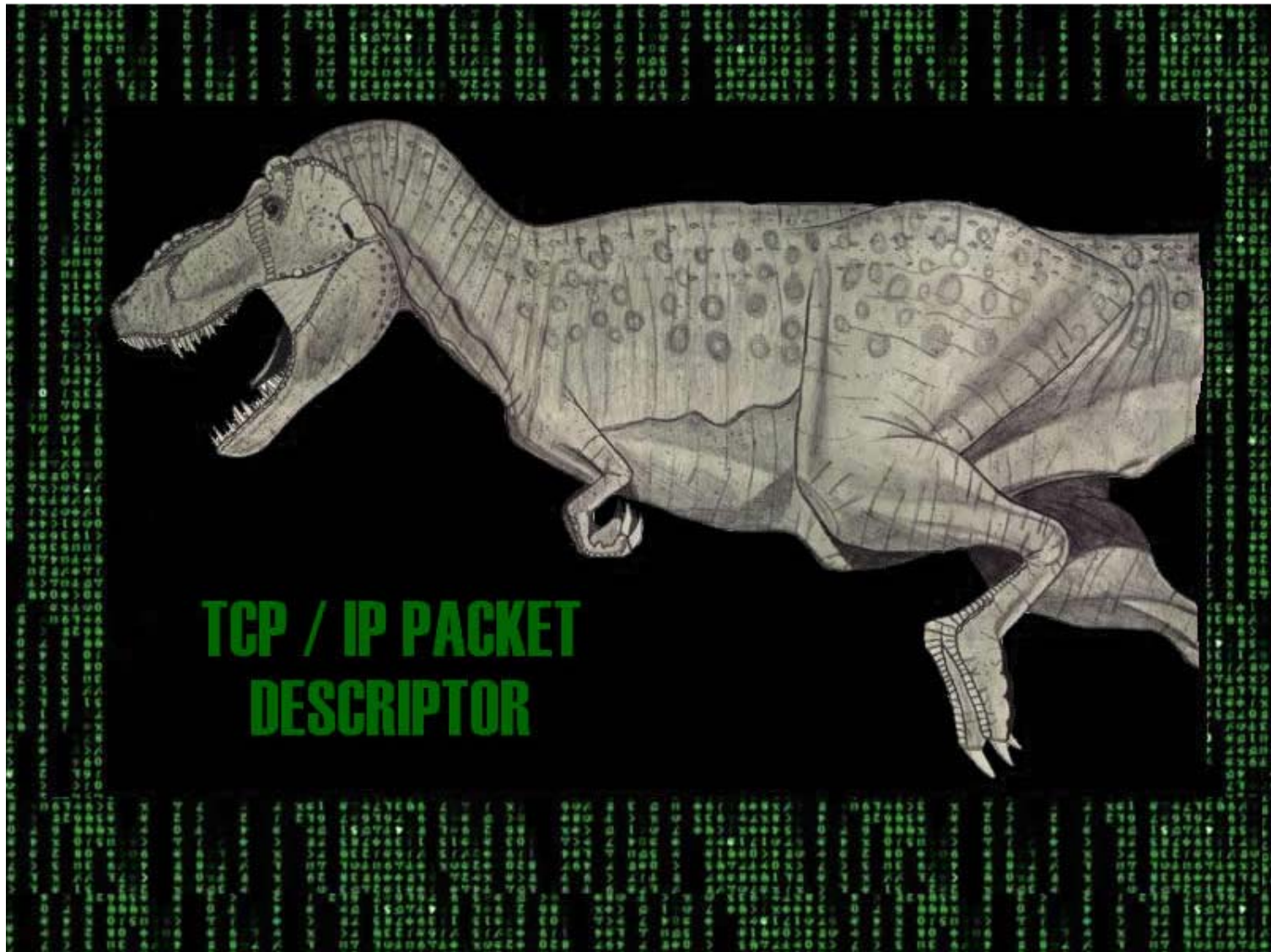
Lauren Englisbe, Team Leader

Jayme Gresen, Librarian

Jeff Habiniak, Database Administrator



# Prototype Overview





# Ethernet Packet



IPv4  
IPv6



ASCII  
Binary  
Hexadecimal  
Decimal

FTP  
TCP  
IP

Bits																															
0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Version				IHL				Type of Service				Total Length																			
0 1 0 0				0 1 0 1				0 0 0 1 0 0 0 0				0 0 0 0 0 0 0 0 1 1 0 1 0 0 1																			
Identification								Flags				Fragment Offset																			
1 0 1 0 1 0 1 0 0 1 0 0 0 0 0								0 1 0				0 0 0 0 0 0 0 0 0 0 0 0 0 0																			
Time to Live								Protocol				Header Checksum																			
0 1 0 0 0 0 0 0								0 0 0 0 0 1 1 0				0 0 0 0 1 1 1 0 1 0 0 0 0 1 0 1																			
Source IP Address																															
1 1 0 0 0 0 0 1 0 1 0 1 0 0 0 0 0 0 0 0 0 0 0 0 1 0 0 1 1 1																															
Destination IP Address																															
1 1 0 0 0 0 0 0 1 0 1 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 1 1 0 0 1 0 1																															
Options (if any, variable length, padded with 0's, 40 bytes maximum length)																															
Data (TCP PDU)																															
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31																															

**IP > Header Checksum for the selected FTP PDU**

Field Name: *Header Checksum*

**Purpose and Definition:**  
The Header Checksum is a 16-bit field. The Checksum is the 16-bit one's complement sum of all 16-bit words in the header. For purposes of computing the checksum, the initial value of its field is zero. When both header checksums are equal, then the header bits are correct. If either checksums vary, then a new, correct packet will need to be sent.

Field Key: not applicable

Data value (hexadecimal): 0E 85

**Data values in other bases:**

Hexadecimal 0 E 8 5

Binary 0000 1110 1000 0101







IPv4  
IPv6



ASCII  
Binary  
Hexadecimal  
Decimal

FTP  
TCP  
IP

0	1	2	3	4	5	6
Version			IHL			
0 1 0 0			0 1 0			
0						
Ident						
1 0 1 0 1 0 1						
4						
Time to Live						
0 1 0 0 0 0						
8						
Header Lengths						
1 1 0 0 0 0						
12						
Options (if any)						
1 1 0 0 0 0						
16						
Options (if any)						
20						
IP						
0 1 2 3 4 5 6						

Source Port Number																Destination Port Number															
0 0 0 1 0 3 1 E E 2																F 8 1 F 0 0 8 5 0 8															
0				1				2				3																			
Sequence Number																															
0 0 3 C A A 3 C 4 0 0 0 4 0 0 6 0 E A 3																															
4				5				6				7																			
Acknowledgment Number																															
0 0 6 5 8 0 3 0 0 0 1 5 8 1 A 5 1 6 5 6																															
8				9				10				11																			
Header Lengths		Reserved		ACK		PSH		RST		SYN		FIN		Window Size																	
1 6 D 0		B F 8 D 0 0		0 0		1 0		0 0		0 0		0 0		0 5 6 4 0 4 0 2 0 8																	
12				13				14				15																			
TCP Checksum								Urgent Pointer																							
B C 6 0 0 0 0 0 0 0 0 1 0 3								0 0 0 3 0 0 0 0 0 0 0 0																							
16				17				18				19																			
Options																															
20				21				22				23																			
Data (FTP PDU)																															
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 1 8 19 20 21 22 23 24 2 5 26 27 28 29 30 31																															

**FTP Information Field**  
RFC Link: <http://www.scit.wlv.ac.uk/rfc/rfc9xx/RFC959.html>

**PASS (Password)**  
The argument field is a Telnet string specifying the user's password. This command must be immediately preceded by the user name and command, and, for some sites, completes the user's identification for access controls.

**What is Contained in the Packet:**  
Request: PASS  
Request Arg: f1a2k3user

**Data values (hexadecimal):**  
50 41 53 53 20 66 31 61 32 6B 33 75 73 65 72 0D 0A

ASCII:	P	A	S	S	SPC
Hexadecimal:	5 0	4 1	5 3	5 3	2 0
Binary:	0101 0000 0100 0001 0101 0011 0101 0011 0010 0000				
Decimal:	80	65	83	83	32

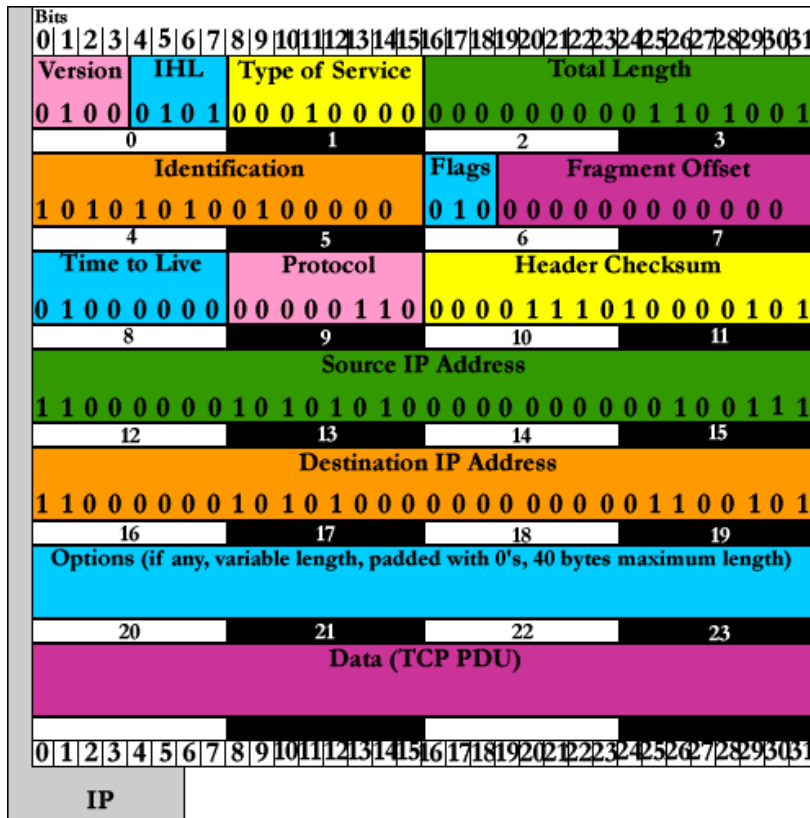
ASCII:	f	1	a	2	k
Hexadecimal:	6 6	3 1	6 1	3 2	6 B
Binary:	0110 0110 0011 0001 0110 0001 0011 0010 0110 1011				
Decimal:	102	49	97	50	107

ASCII:	3	u	s	e	r
Hexadecimal:	3 3	7 5	7 3	6 5	7 2
Binary:	0011 0011 0111 0101 0111 0101 0110 0101 0111 0010				
Decimal:	51	117	115	101	114

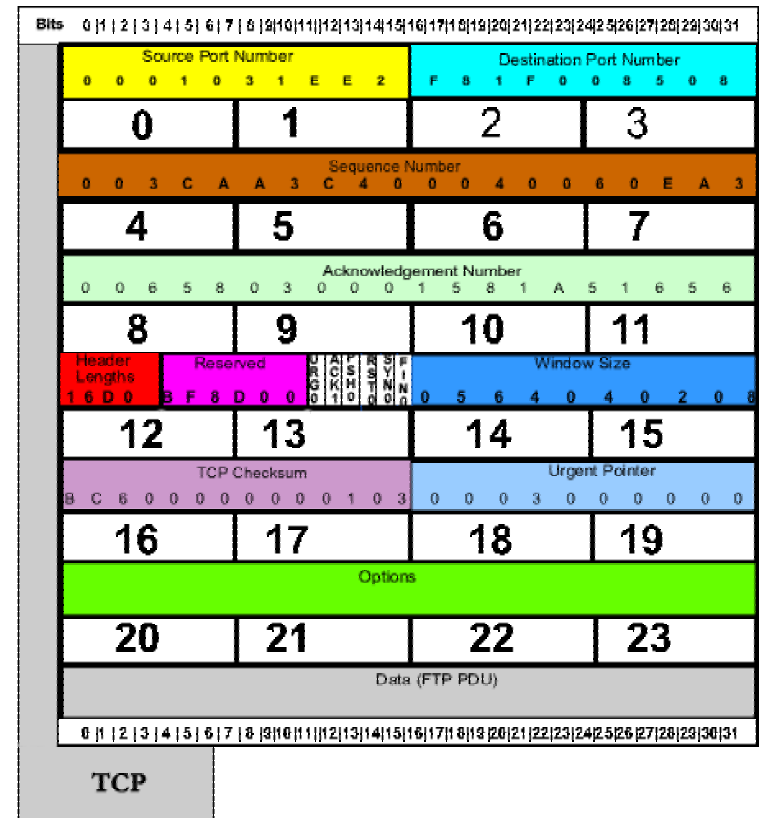
ASCII:	lr	ln
Hexadecimal:	0 D	0 A
Binary:	0000 1101 0000 1010	
Decimal:	13	10

# Protocol Options

Example of IP PDU



Example of TCP PDU



# Information Field Options

IP > TCP Source Port for the selected FTP PDU

Field Name: **Source Port**

**Purpose and Definition:**

This 16-bit number represents the name of the application that sent the data in the IP Packet.

Field Key: not applicable

Data value (hexadecimal): 0E 85

Data values in other bases:

Hexadecimal	8	0	3	0
Binary	1000	0000	0011	0000
Decimal	128		48	
ASCII	↑		0	

## FTP INFORMATION FIELD

**PASS (Password)**

RFC Link: <http://www.scit.wlv.ac.uk/rfc/rfc9xx/RFC959.html>

The argument field is a Telnet string specifying the user's password. This command must be immediately preceded by the user name and command, and, for some sites, completes the user's identification for access controls.

**What Is Contained in the Packet:**

Request: PASS  
Request Arg: f1a2k3user

**Data Values (hexadecimal):**

50 41 53 53 20 66 31 61 32 6B 33 75 73 65 72 0D 0A

**Data Values in Other Bases:**

ASCII:	P	A	S	S	SPC
Hexadecimal:	5 0	4 1	5 3	5 3	2 0
Binary:	0101 0000	0100 0001	0101 0011	0101 0011	0010 0000
Decimal:	80	65	83	83	32
ASCII:	f	1	a	2	k
Hexadecimal:	6 6	3 1	6 1	3 2	6 B
Binary:	0110 0110	0011 0001	0110 0001	0011 0010	0110 1011
Decimal:	102	49	97	50	107
ASCII:	3	u	s	e	r
Hexadecimal:	3 3	7 5	7 3	6 5	7 2
Binary:	0011 0011	0111 0101	0111 0101	0110 0101	0111 0010
Decimal:	51	117	115	101	114
ASCII:	\r	\n			
Hexadecimal:	0 D	0 A			
Binary:	0000 1101	0000 1010			
Decimal:	13	10			

# Ethernet Packet



IPv4  
IPv6



ASCII  
Binary  
Hexadecimal  
Decimal

FTP  
TCP  
IP

0	1	2	3	4	5	6
Version			IHL			
0 1 0 0			0 1 0			
0						
Ident						
1 0 1 0 1 0 1						
4						
Time to Live						
0 1 0 0 0 0 0						
8						
Header Lengths						
1 1 0 0 0 0 0						
12						
Options (if any)						
1 1 0 0 0 0 0						
16						
Options (if any)						
20						
Options (if any)						
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Options (if any)						

Source Port Number																Destination Port Number															
0 0 0 1 0 3 1 E E 2																F 8 1 F 0 0 8 5 0 8															
0				1				2				3																			
Sequence Number																															
0 0 3 C A A 3 C 4 0 0 0 4 0 0 6 0 E A 3																															
4				5				6				7																			
Acknowledgement Number																															
0 0 6 5 8 0 3 0 0 0 1 5 8 1 A 5 1 6 5 6																															
8				9				10				11																			
Header Lengths				Reserved				Window Size																							
1 6 D 0				B F 8 D 0 0				0 5 6 4 0 4 0 2 0 8																							
12				13				14				15																			
TCP Checksum																Urgent Pointer															
B C 6 0 0 0 0 0 0 0 0 1 0 3																0 0 0 3 0 0 0 0 0 0 0 0															
16				17				18				19																			
Options																															
20				21				22				23																			
Data (FTP PDU)																															
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 1 8 19 20 21 22 23 24 2 5 26 27 28 29 30 31																															

**FTP INFORMATION FIELD**  
 RFC Link: <http://www.scit.wlv.ac.uk/rfc/rfc9xx/RFC959.html>

**PASS (Password)**  
 The argument field is a Telnet string specifying the user's password. This command must be immediately preceded by the user name and command, and, for some sites, completes the user's identification for access controls.

**What is Contained in the Packet:**  
 Request: PASS  
 Request Arg: fla2k3user

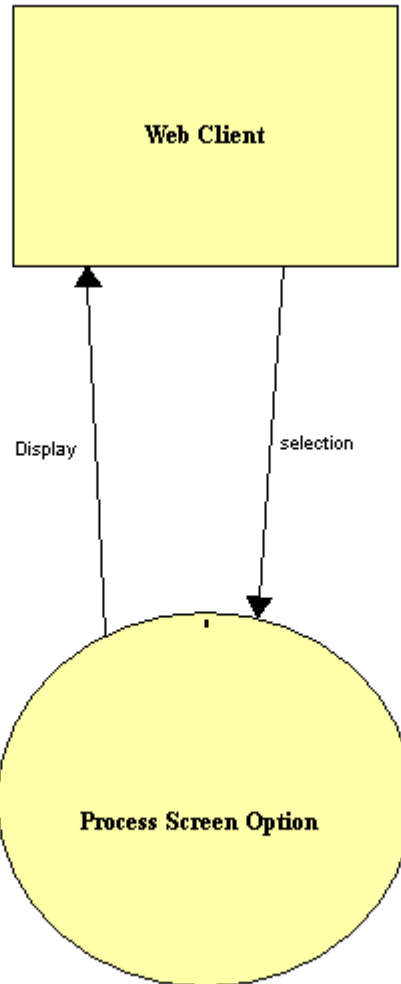
**Data Values (hexadecimal):**  
 50 41 53 53 20 66 31 61 32 6B 33 75 73 65 72 0D 0A

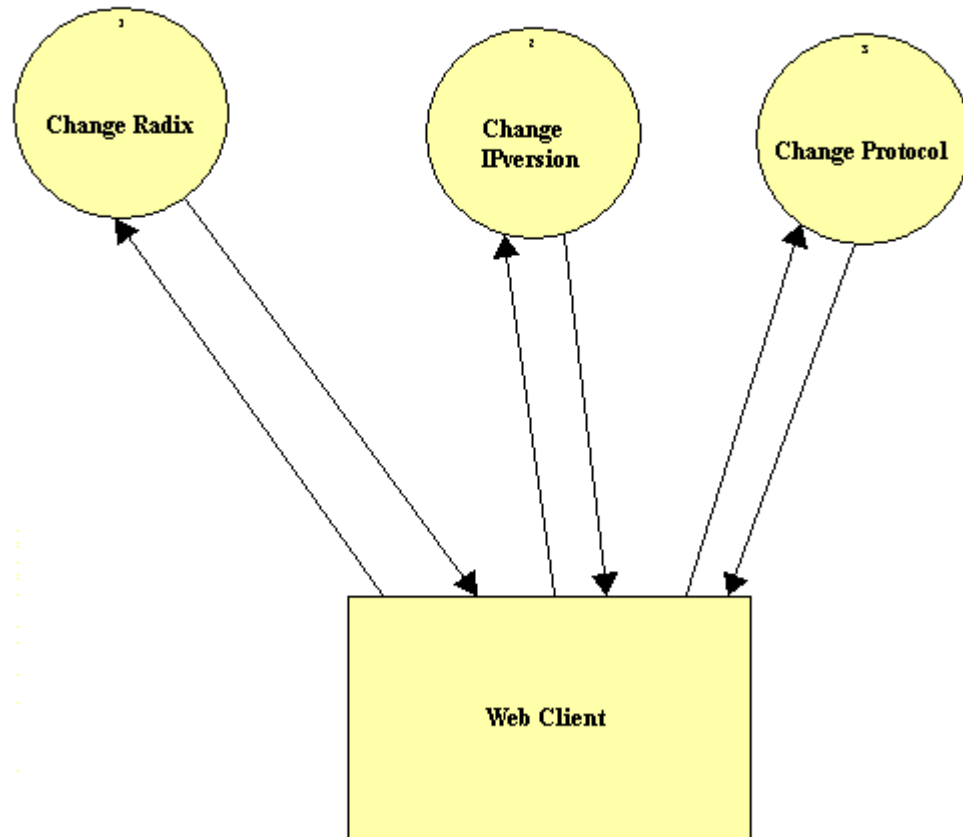
**Data Values in Other Bases:**

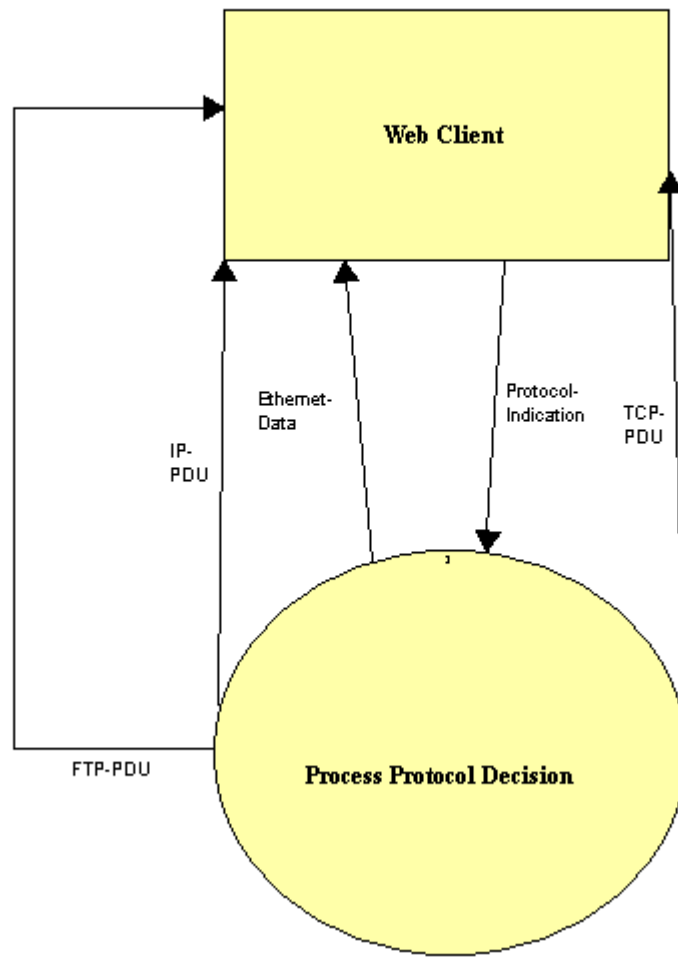
ASCII:	P	A	S	S	SPC
Hexadecimal:	5 0	4 1	5 3	5 3	2 0
Binary:	0101 0000	0100 0001	0101 0011	0101 0011	0010 0000
Decimal:	80	65	83	83	32
ASCII:	f	1	a	2	k
Hexadecimal:	6 6	3 1	6 1	3 2	6 B
Binary:	0110 0110	0011 0001	0110 0001	0011 0010	0110 1011
Decimal:	102	49	97	50	107
ASCII:	3	u	s	e	r
Hexadecimal:	3 3	7 5	7 3	6 5	7 2
Binary:	0011 0011	0111 0101	0111 0101	0110 0101	0111 0010
Decimal:	51	117	115	101	114
ASCII:	lr	ln			
Hexadecimal:	0 D	0 A			
Binary:	0000 1101	0000 1010			
Decimal:	13	10			



# Data Structures









# IP PDU > *Version* for the selected ICMP PDU

**Field Name:** *Version*

**Purpose and Definition:** Version is a 4-bit field that indicates the format of the internet header.

**Field Key:** 4 = IPv4  
6 = IPv6

**Data value (decimal):** 4

**Data values in other bases:**

Hexadecimal	4
Binary	0110
Decimal	4

# IP > ICMP Header > *Checksum* for the selected ICMP PDU

**Field Name:** *Checksum*

**Purpose and Definition:** The checksum is the 16-bit one's complement of the one's complement sum of the ICMP message, starting with the ICMP type. For computing the checksum, the checksum field should initially be zero.

**Field Key:** *Not applicable*

**Data value (hexadecimal):** C9 15

**Data values in other bases:**

Hexadecimal	C	9	1	5
Binary	1100	1001	0001	0101
Decimal	201		21	
ASCII	↑		!	

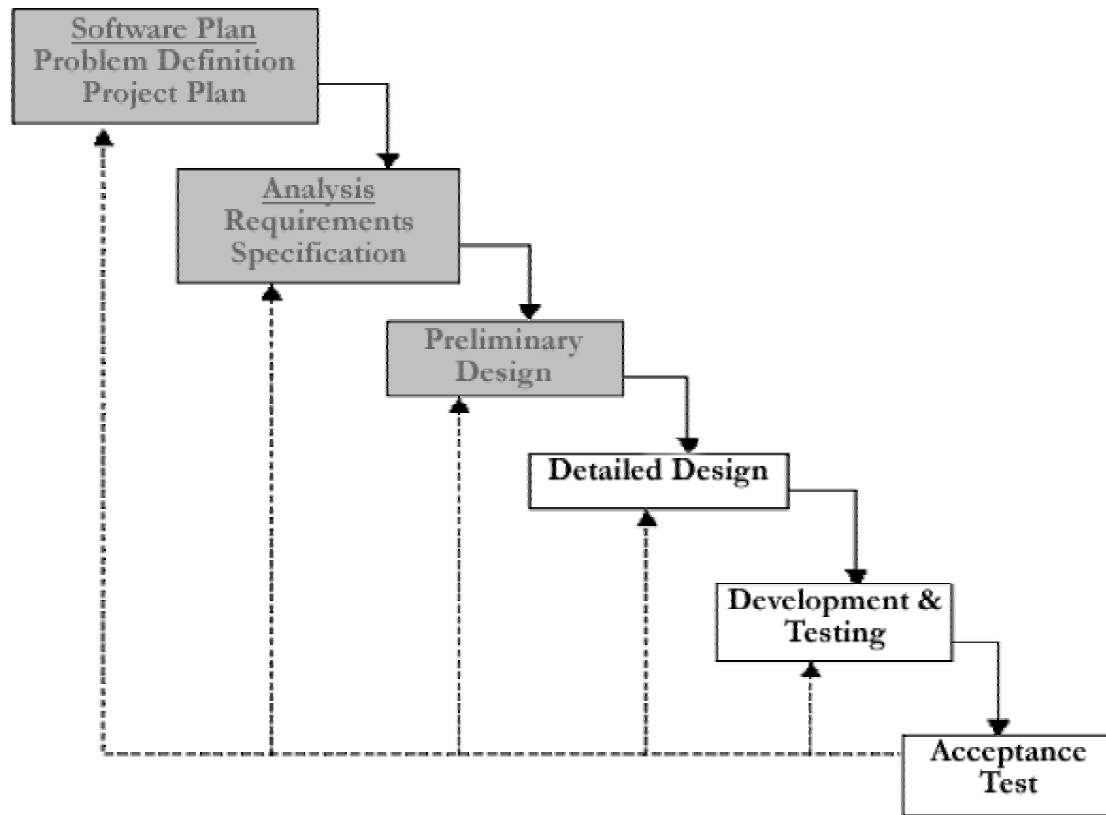
# Hardware, Software and Human Interfaces

- Macromedia MX – Fireworks, Dreamweaver
- HTML and perhaps PHP (Version 4.1.2 )
- Will be hosted as a web site on the Siena College Computer Science Department's Oraserv Linux server (Red Hat version 7.1), running the Apache web server (version 1.3.19)
- Netscape Navigator 7.x or greater and Internet Explorer 5.x or greater web browser

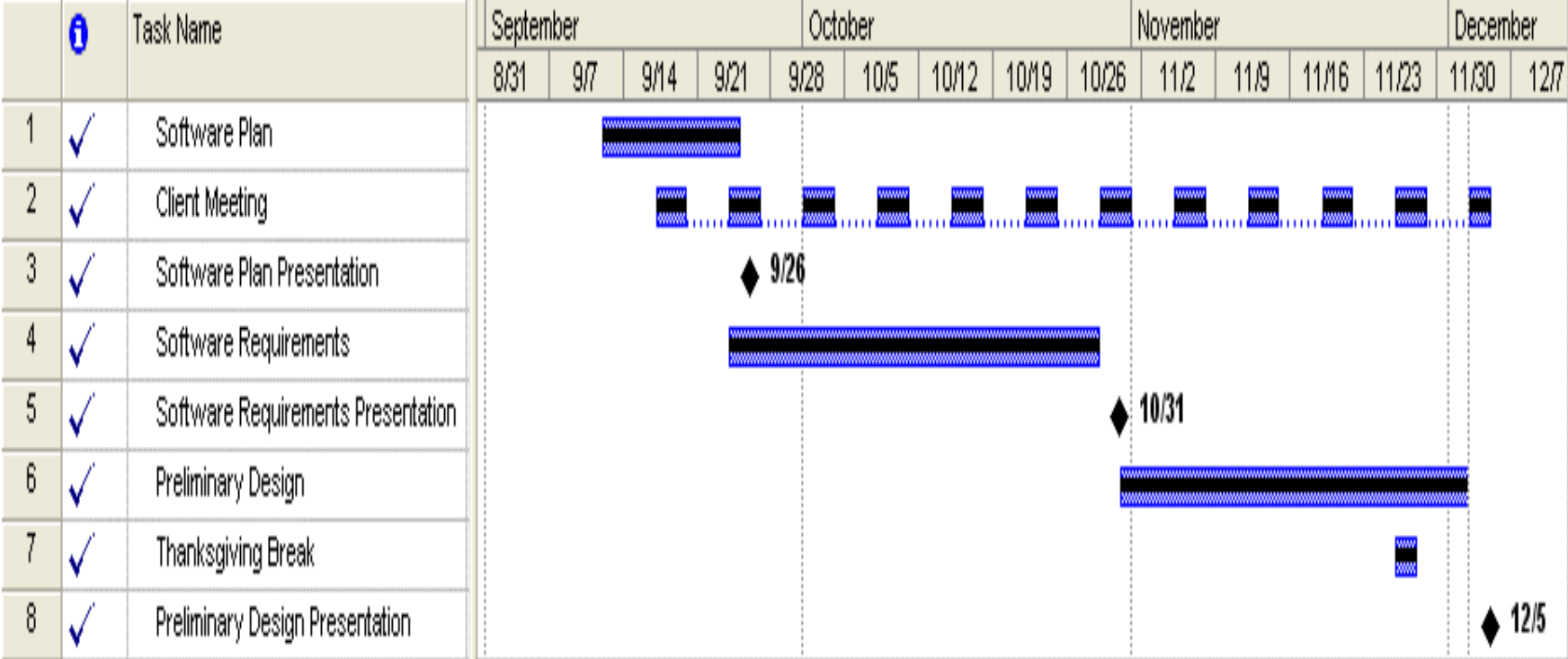


# The Next Phase

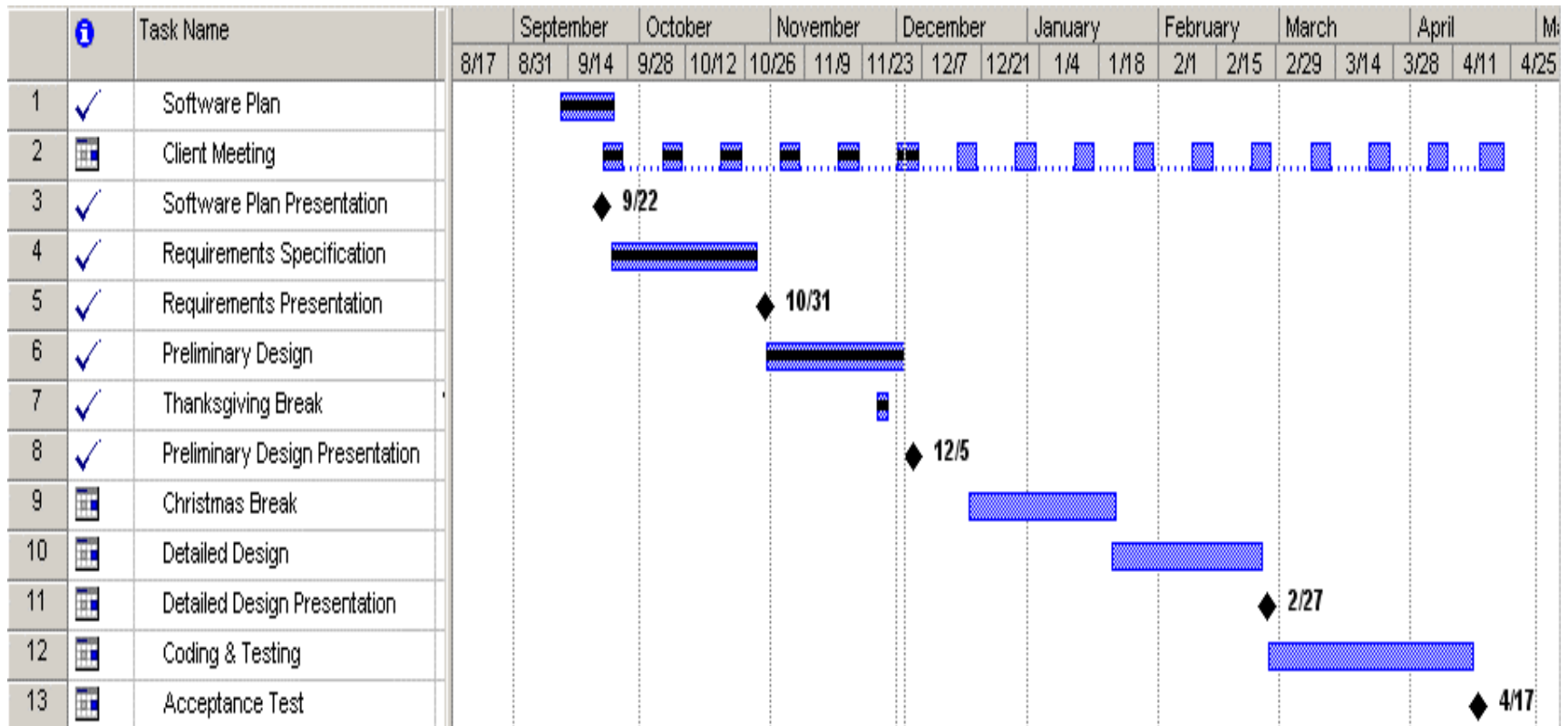
# Linear Sequential Model (Classic Waterfall)



# Fall Schedule



# Year-Long Schedule



# The Next Documents

## ■ Detailed Design

- Documents – February 25, 2004
- Presentation – February 27, 2004

## ■ Acceptance Test

- Documents – April 15, 2004
- Presentation – April 17, 2004



# Questions?





Thank you!