

ELLYPUNK

Yuki Time

WEEKLY DIGEST

21-27 September 2026



This week

21-27 September 2026

Available archived editions, in their original date order.

MONDAY / 21 September 2026

Yuki Time: MTU Mismatch: When Small Pings Hide a Broken Path

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TUESDAY / 22 September 2026

Yuki Time: TCP Handshake: Three Steps Before Data Moves

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YUKI TIME

MTU MISMATCH SMALL PINGS HIDE IT

WHEN A SMALL PROBE PASSES BUT A LARGE TRANSFER STALLS
HARDWARE & INFRASTRUCTURE · INTERMEDIATE · 21 SEP 2026

1 SMALL WORKS. LARGE STALLS.

“ A small ping reaches the server.
But a larger transfer hangs.
Connectivity is not the whole story.
— YUKI

MTU limits one packet on a link.
Path MTU is the smallest link MTU on the route.

SMALL PACKET · FITS THE WHOLE PATH
It passes, so the endpoint looks reachable.

LARGER PACKET · EXCEEDS ONE HOP
It needs valid feedback or a smaller packet.

2 TRACE THE SMALLEST HOP

“ Yuki finds a lower-MTU gateway.
That single hop sets the path limit.
— YUKI

PATH FEEDBACK MATTERS

IPv4: Fragmentation Needed may report the limit.
IPv6: routers send Packet Too Big; they do not fragment in transit.
Blocked feedback can create a black-hole connection.

3 PROBE A REPRESENTATIVE IPV4 PATH

1472-BYTE PAYLOAD IS A STARTING POINT FOR A 1500-BYTE IPV4 PATH; TUNNELS AND OPTIONS VARY

OBSERVE

Small probe passes
Large transfer stalls

LINUX

ping -4 -M do -s 1472
example.com

macOS

ping -D -s 1472
example.com

WINDOWS

ping /4 /f /l 1472
example.com

Use a host you are authorised to test. Reduce the payload to find the boundary; ICMP echo is a clue, not proof that the application path is healthy.

4 FIX, THEN PROVE

“ Yuki aligns the interface or tunnel MTU,
keeps required ICMP feedback working,
then repeats the real large transfer.
— YUKI

VERIFY THE APPLICATION

Test the same source, destination and route.
Confirm the effective MTU on every relevant hop.
Check Packet Too Big or Fragmentation Needed handling.
Retest after tunnel, VPN or interface changes.
Monitor for stalls—not only ping success.

REPRESENTATIVE LARGE TRANSFER → PASSED

Linux uses iputils syntax; macOS and Windows use different native flags. These probes are IPv4 examples.
Headers, options, encapsulation and routes change the usable payload. Do not treat 1472 bytes as universal.

A small ping proves reachability.
A representative transfer proves the path.

Sources: RFC 8201 · RFC 8899 · Microsoft ping · Linux iputils ping

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YUKI TIME

TCP HANDSHAKE

THREE STEPS TO CONNECT

BEFORE APPLICATION DATA MOVES

HARDWARE & INFRASTRUCTURE · BEGINNER · 22 SEP 2026

1

YUKI OPENS A CONNECTION

“ A client wants to talk to a server.
Both sides first agree to begin a TCP connection.
Watch the three messages, then the data.
— YUKI

TCP carries a reliable byte stream.
The handshake starts that connection.

CLIENT · STARTS THE REQUEST
Yuki checks the client end.

SERVER · ANSWERS THE REQUEST
The server must be listening.



2

FIRST, THE CLIENT ASKS

“ Yuki sees a SYN leave the client.
The server answers with SYN-ACK.
— YUKI

WHAT THE REPLY MEANS

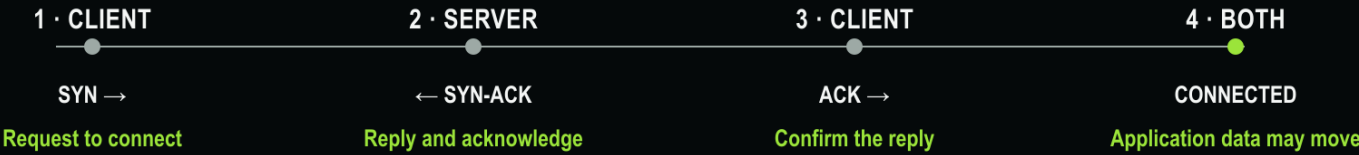
SYN asks to start and sync sequence numbers.
SYN-ACK acknowledges the client and offers the server side.
The client's final ACK confirms the reply.



3

THREE MESSAGES, IN ORDER

CLIENT AND SERVER EXCHANGE SYN, SYN-ACK, ACK; THEN THE CONNECTION IS ESTABLISHED



If a reply never arrives, the connection may time out; a completed handshake only proves this TCP setup.

4

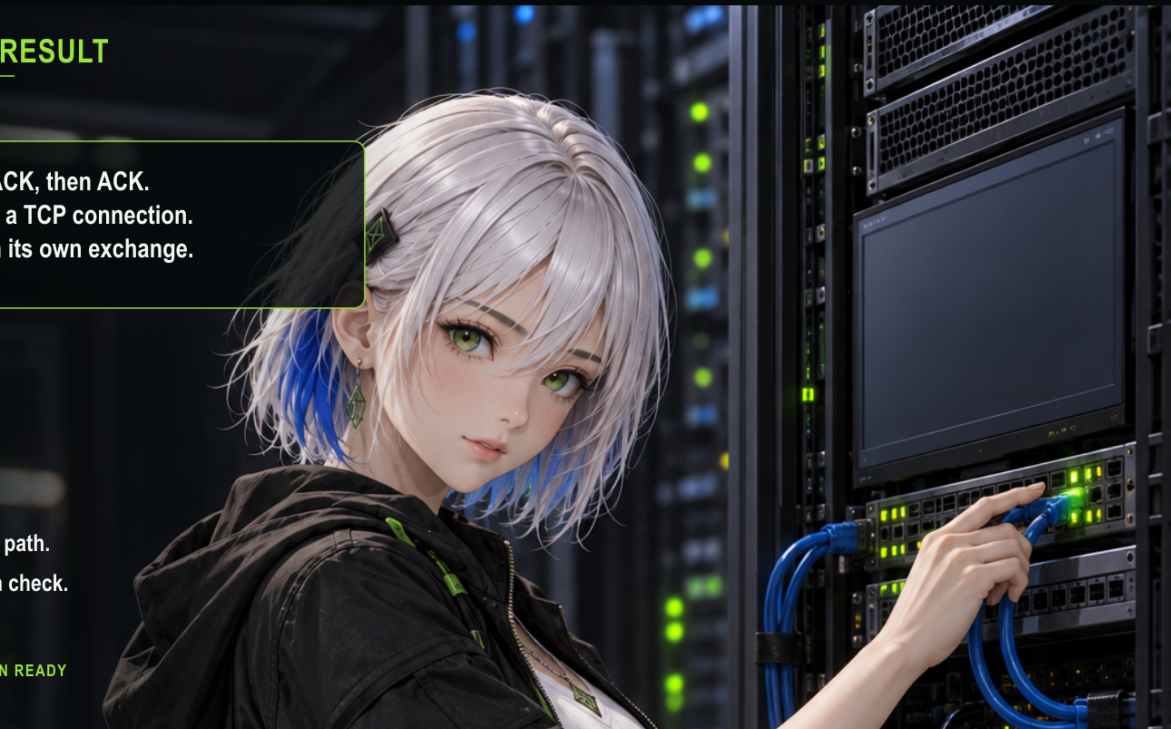
YUKI CHECKS THE RESULT

“ She confirms SYN, SYN-ACK, then ACK.
Both endpoints now have a TCP connection.
The application can begin its own exchange.
— YUKI

READ THE SIGNALS

SYN: client starts.
SYN-ACK: server answers.
ACK: client confirms.
If one step is missing, inspect that path.
Application success needs its own check.

THREE STEPS COMPLETE → CONNECTION READY



The handshake is about TCP connection setup. It does not itself encrypt traffic.
For TCP traffic, TLS has its own handshake after TCP setup.

SYN. SYN-ACK. ACK.
Then the data can move.

Sources: IETF RFC 9293 · Cloudflare glossary

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YUKI TIME

SSD WEAR

WHY SPARE BLOCKS MATTER

WHAT THE DRIVE KEEPS IN RESERVE

HARDWARE & INFRASTRUCTURE · INTERMEDIATE · 23 SEP 2026

1 YUKI NOTICES A HEALTH WARNING

“ An SSD can keep working as its flash wears. Its controller has extra space for maintenance. What happens when that reserve runs low? ”

— YUKI

Flash blocks tolerate limited erase cycles. The controller spreads writes and retires weak blocks.

HOST · SEES LOGICAL STORAGE

The operating system cannot see each flash block.

CONTROLLER · MANAGES PHYSICAL FLASH

It maps writes and keeps reserve capacity.

2 THE RESERVE BUYS ROOM

“ Yuki finds a worn block in the test fixture. The controller can map data to healthy space. ”

— YUKI

WHAT SPARE SPACE DOES

Reserved capacity supports replacement and maintenance. Wear levelling spreads repeated writes. The reserve is finite; it is not a backup.

3 FROM WEAR TO ACTION

A WEAK BLOCK IS RETIRED; HEALTHY CAPACITY TAKES ITS PLACE

1 · WRITE



Flash is programmed

2 · WEAR



A block becomes unreliable

3 · REMAP



Controller uses healthy space

4 · CHECK



Read health signals

Conceptual flow: exact remapping and health values vary by drive and firmware.

4 YUKI READS THE HEALTH LOG

“ Available Spare estimates remaining reserve. Percentage Used estimates endurance consumed. Critical Warning flags urgent conditions. ”

— YUKI

WATCH THE DRIVE, PROTECT THE DATA

Check the drive vendor’s health guidance. Trend Available Spare and Percentage Used. Treat Critical Warning as an escalation signal. Keep verified backups; plan replacement.

FALLING SPARE OR WARNING → BACK UP AND PLAN REPLACEMENT

NVMe health fields are normalized or vendor estimated.

A healthy-looking value cannot guarantee future reliability.

Spare blocks buy time—not certainty. Watch health, back up, replace deliberately.

Sources: Samsung Semiconductor · NVMe Express

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YUKI TIME UPS RUNTIME

SECONDS FOR A CLEAN SHUTDOWN

BATTERY POWER BUYS A SAFE EXIT

HARDWARE & INFRASTRUCTURE · INTERMEDIATE · 24 SEP 2026

1 YUKI SEES THE UPS TAKE OVER

“ Mains power fails. The UPS carries the server.
The battery has limited time.
Will the host stop cleanly before power runs out?
— YUKI

A UPS bridges an outage with battery power.
Estimated runtime changes with load, charge and battery age.

UPS · REPORTS POWER AND BATTERY STATE
Runtime is an estimate, not a promise.

HOST · SHUTS DOWN ITS WORKLOAD
The OS needs a monitored shutdown path.

2 CHECK THE TIME BUDGET

“ Yuki checks the load and runtime estimate.
She leaves margin for an orderly shutdown.
— YUKI

DO NOT WAIT FOR THE LAST SECOND

Battery reserve must outlast the shutdown sequence.
A low-battery signal may arrive too late for a long shutdown.
Choose a tested early trigger when necessary.

3 FROM OUTAGE TO SAFE STOP

BATTERY SUPPORTS THE HOST WHILE IT STOPS CLEANLY

1 · OUTAGE



UPS switches to battery

2 · OBSERVE



Check load and estimate

3 · TRIGGER



Start orderly shutdown

4 · VERIFY



Host stops with reserve left

Conceptual flow: signals and supported controls vary by UPS, driver and host.

4 YUKI CONFIRMS THE STOP

“ The host records an orderly shutdown.
The server stops before battery depletion.
After mains return, verify service and data.
— YUKI

BUILD THE MARGIN

Monitor UPS state from the host.
Measure real shutdown duration.
Set an early trigger with safety margin.
Retest after load or battery changes.

TESTED TRIGGER → CLEAN SHUTDOWN BEFORE BATTERY EMPTY

A displayed runtime is an estimate, not guaranteed seconds.
Use the UPS and OS vendor guidance for your equipment.

UPS runtime is a deadline, not free uptime.
Leave enough battery for a clean stop.

Sources: Schneider Electric · Network UPS Tools

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YUKI TIME PoE BUDGET

WHY THE CAMERA STAYS DARK

A FREE PORT IS NOT FREE POWER

HARDWARE & INFRASTRUCTURE · INTERMEDIATE · 25 SEP 2026

1 YUKI FINDS A DARK CAMERA

“ The camera has an Ethernet lead.
The port is free, but the camera stays dark.
Yuki checks the switch power budget.
— YUKI

PoE sends power and data over Ethernet.
The switch shares a finite power budget.

SWITCH · ALLOCATES PoE POWER
It reserves power for connected devices.

CAMERA · REQUESTS POWER
Its power class sets the needed allocation.

2 CHECK THE SHARED BUDGET

“ Yuki reads total, allocated and free PoE power.
The port reports denied power.
— YUKI

SPARE PORT ≠ SPARE WATTS

In this example, the switch has 8 W free.
The camera requests 15 W.
There is not enough budget to power it.

3 THE POWER DECISION

ILLUSTRATIVE: 120 W TOTAL – 112 W ALLOCATED = 8 W FREE

1 · DETECT

2 · REQUEST

3 · COMPARE

4 · DENY

Camera attached

Needs 15 W

Only 8 W free

Camera stays dark

Actual allocation and port limits depend on the camera and switch model.

4 YUKI PROVES THE CAUSE

“ The switch reports insufficient PoE power.
Yuki checks the camera class and port rating.
An approved capacity change powers the camera.
— YUKI

RESTORE SAFE HEADROOM

Read total, allocated and free PoE power.
Check the port status and camera class.
Use approved capacity or rebalance planned loads.
Verify power, video and remaining headroom.

ENOUGH POWER → CAMERA ON + VIDEO VERIFIED

A free Ethernet port may have no PoE budget left.
Power priority and allocation vary by switch model.

Count available watts, not just empty ports.
Leave power headroom for the next device.

Sources: Cisco PoE guide · Cisco troubleshooting · Ethernet Alliance

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