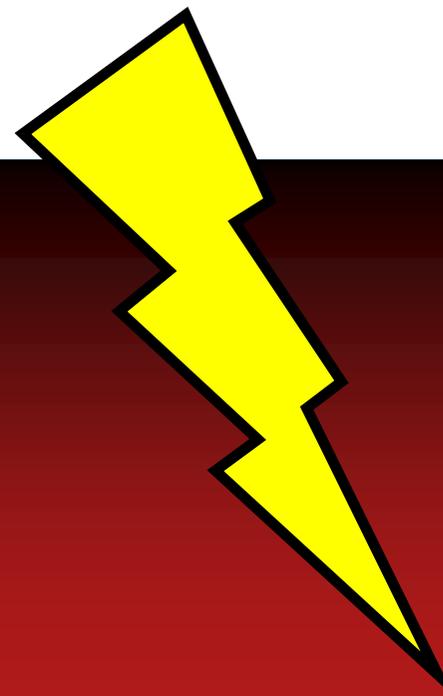


# Reliability

points for discussion



## **draft-irtf-dtnrg-bundle-checksum**

Lloyd Wood, Wesley M. Eddy and Will Ivancic  
Cisco Systems, Verizon/NASA, NASA Glenn.

prepared for discussion at the  
IRTF Delay-Tolerant Networking session  
IETF 71, Philadelphia, March 2008.

# E2E reliability choices – what is checked?

Here, *reliability* is ‘known to be delivered free of errors **end-to-end**’



**reliable header *and* payload  
are covered by checksums**

90+% of applications expect  
error-free delivery.



**unreliable header *but*  
reliable checked payload**

Current bundle protocol spec  
with PIB e2e *or*  
new ‘insecure’ ciphersuites.



**reliable header *but*  
no payload checking**

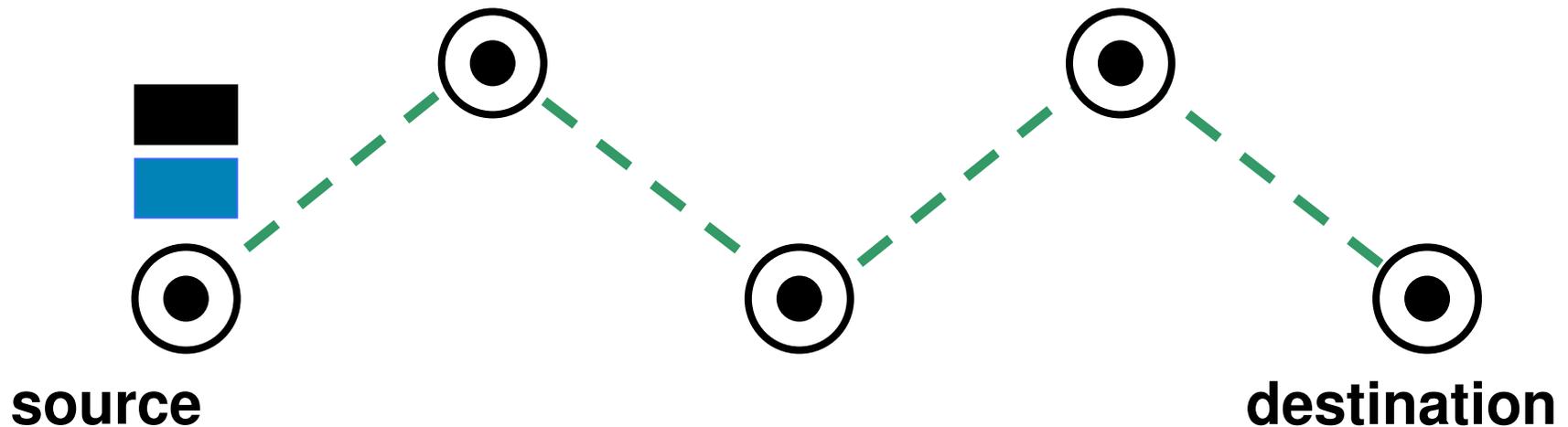
e.g. UDP-Lite. Permits  
application-level ECC,  
error-tolerant codecs, etc.



**no header *or*  
payload checking**

Current bundle protocol spec  
when no ciphersuites in use.

# Control loops: security and custody transfer #1



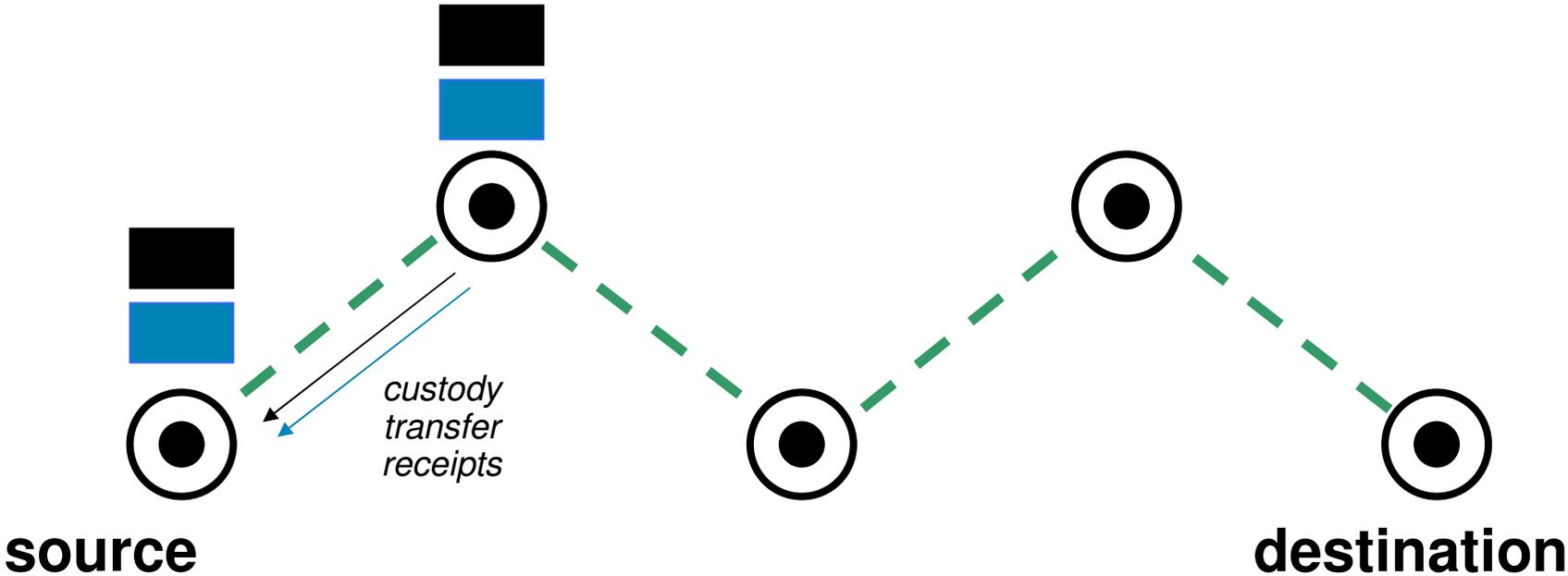
**secure PIB**

as described in bundle security drafts

**insecure  
ciphersuite**

as described in draft-irtf-dtnrg-bundle-checksum

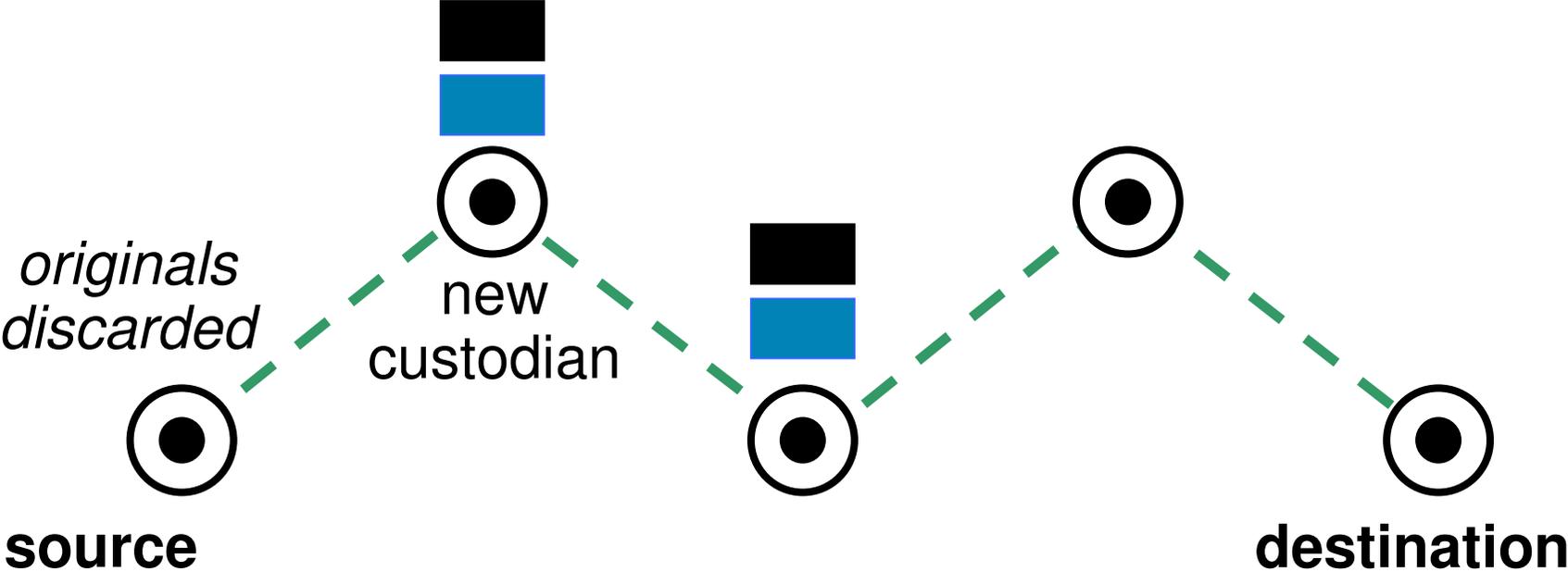
# Control loops: security and custody transfer #2



**secure PIB**

**insecure  
ciphersuite**

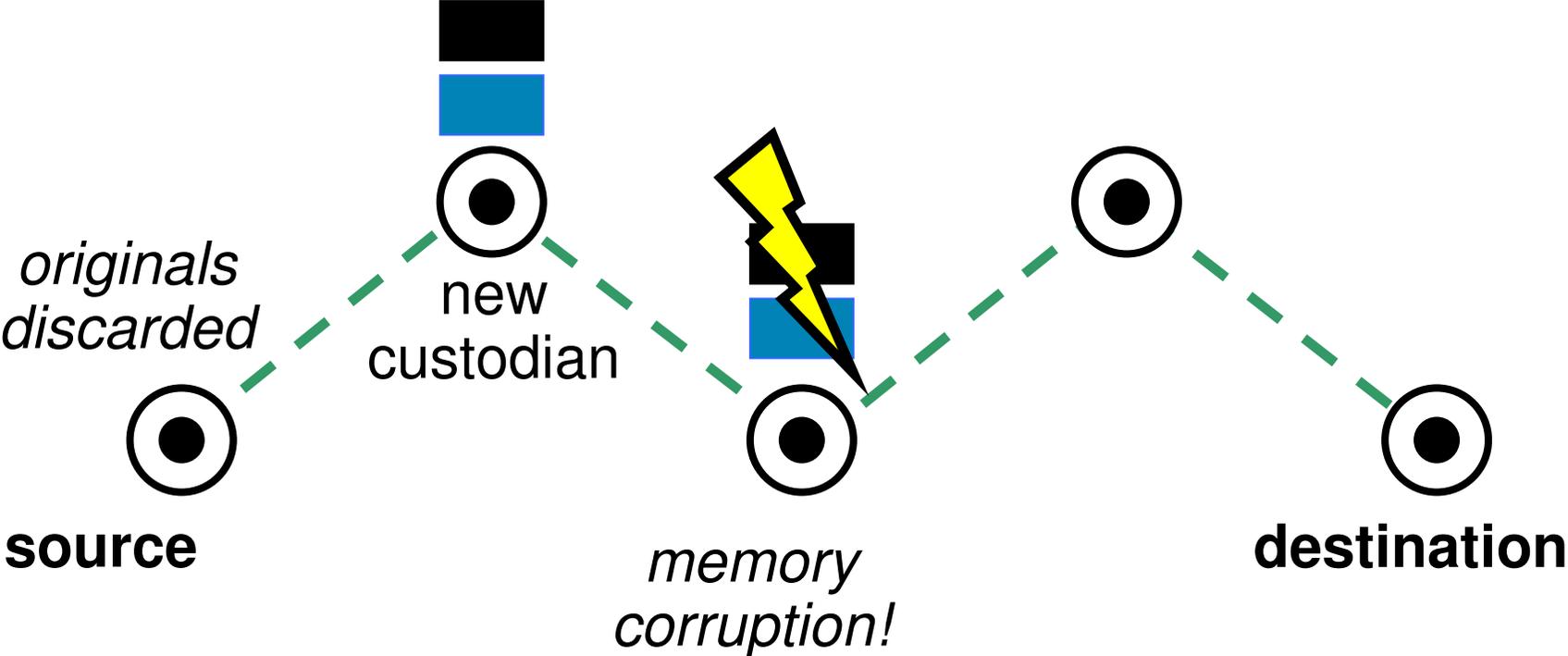
# Control loops: security and custody transfer #3



**secure PIB**

**insecure ciphersuite**

# Control loops: security and custody transfer #4

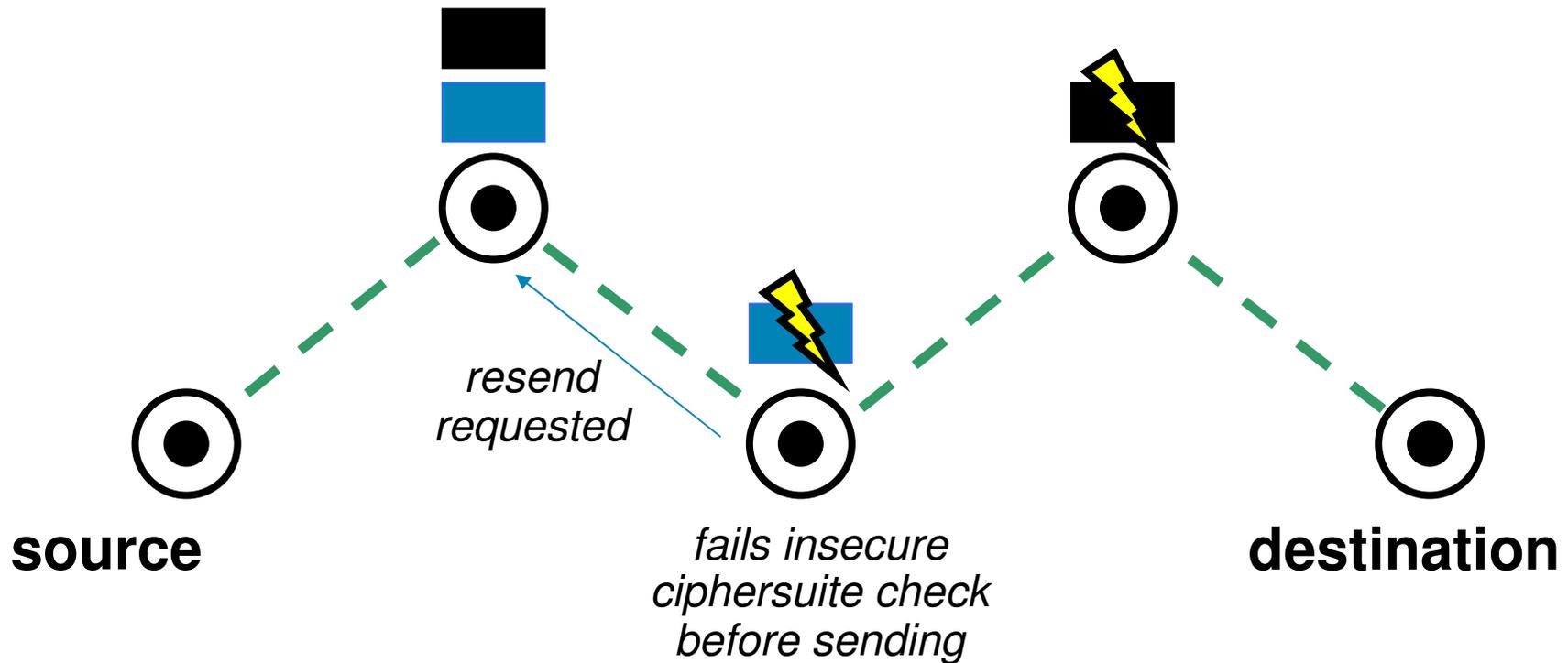


**secure PIB**

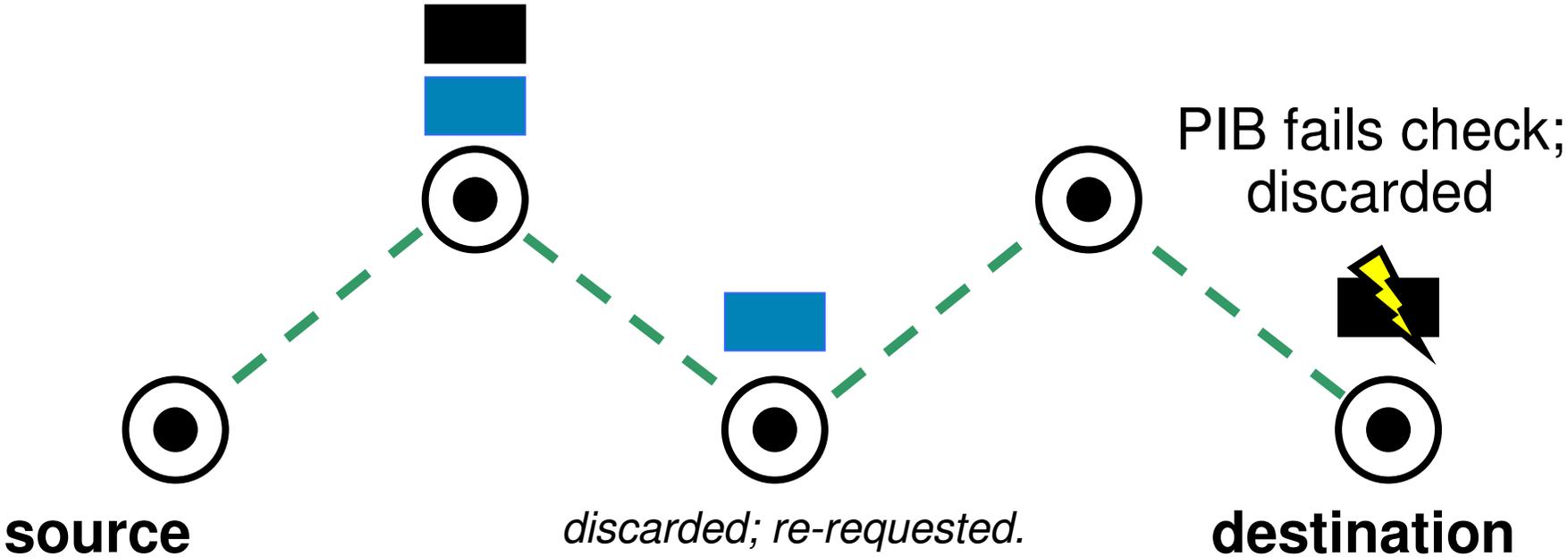
**insecure ciphersuite**

# Control loops: security and custody transfer #5

*no way of verifying content.  
presumed good and sent on.*



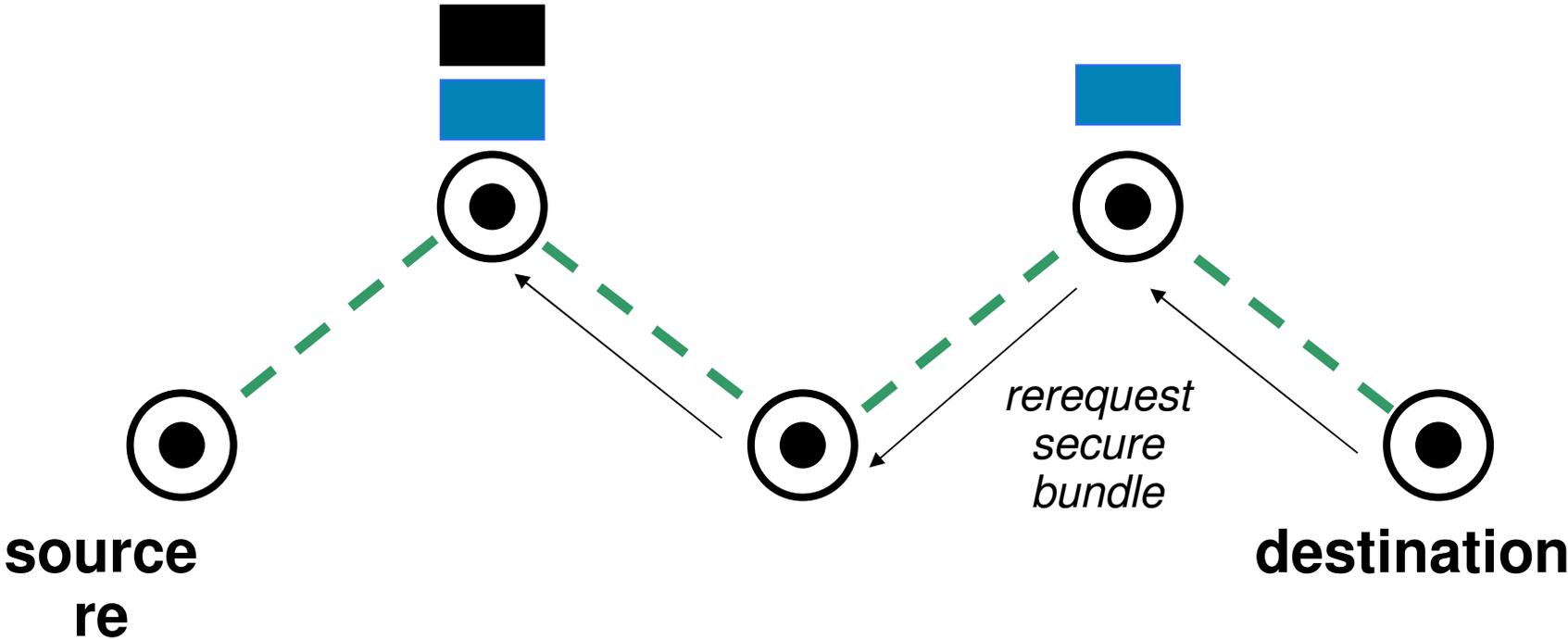
# Control loops: security and custody transfer #6



**secure PIB**

**insecure  
ciphersuite**

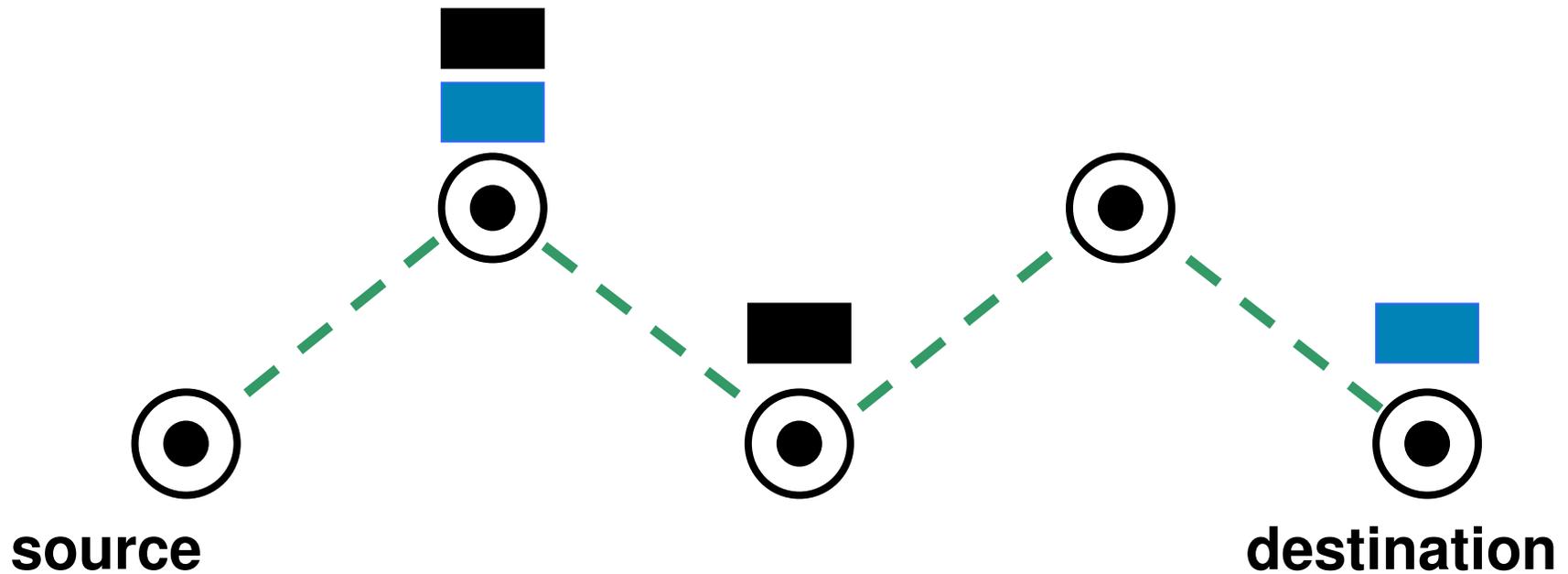
# Control loops: security and custody transfer #7



**secure PIB**

**insecure  
ciphersuite**

# Control loops: security and custody transfer #8



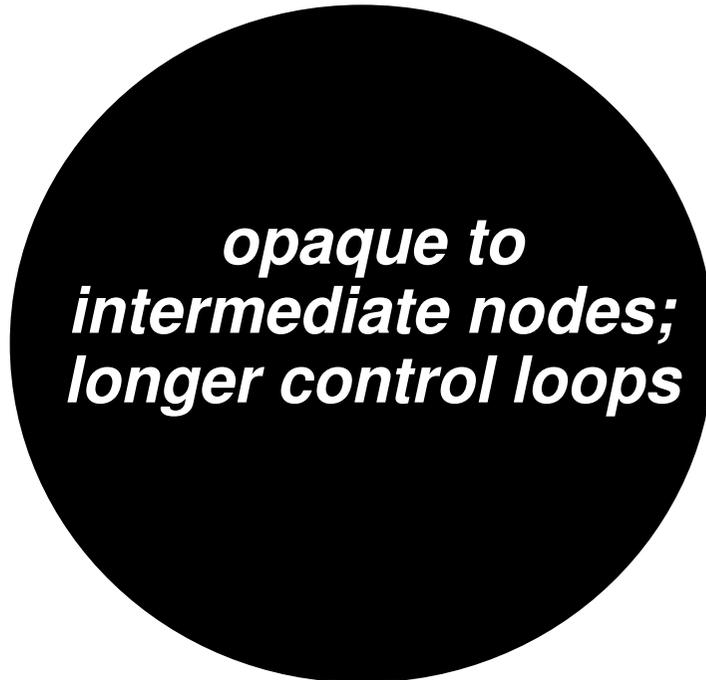
**secure PIB**

**insecure  
ciphersuite**

*Insecure bundle that can be checked in-transit has arrived faster!*

# Tradeoffs

**PIB secure bundle**



**insecure payload  
using INSECURE ciphersuite**

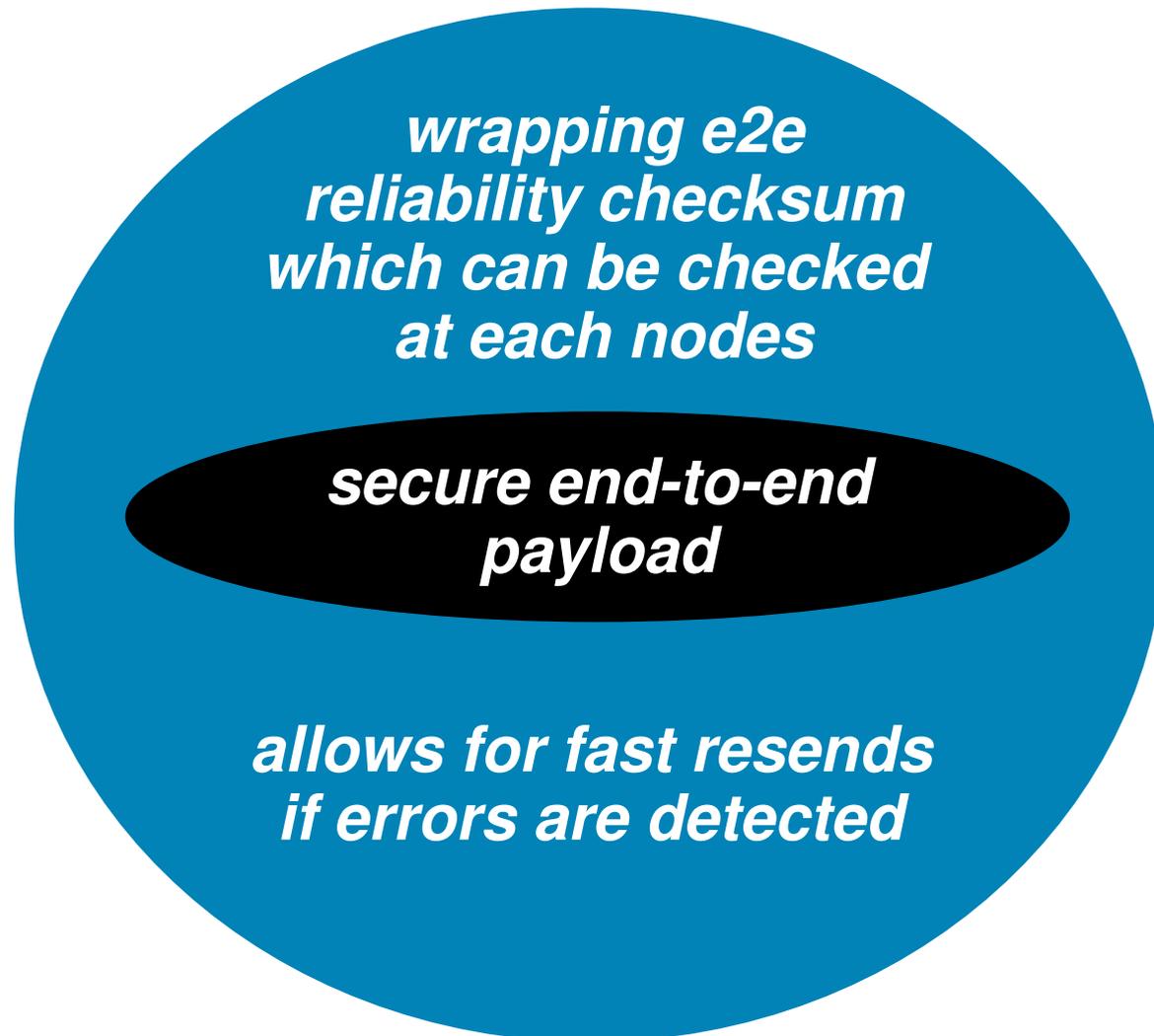


can be used by applications  
implementing their own e2esecurity

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## Best of both worlds – end-to-end

push an e2e reliability wrapper around the secure PIB



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## **draft-irtf-dtnrg-bundle-checksum**

More discussion is needed.  
thankyou.