Lessons Learned From Building A Threat Detection Program

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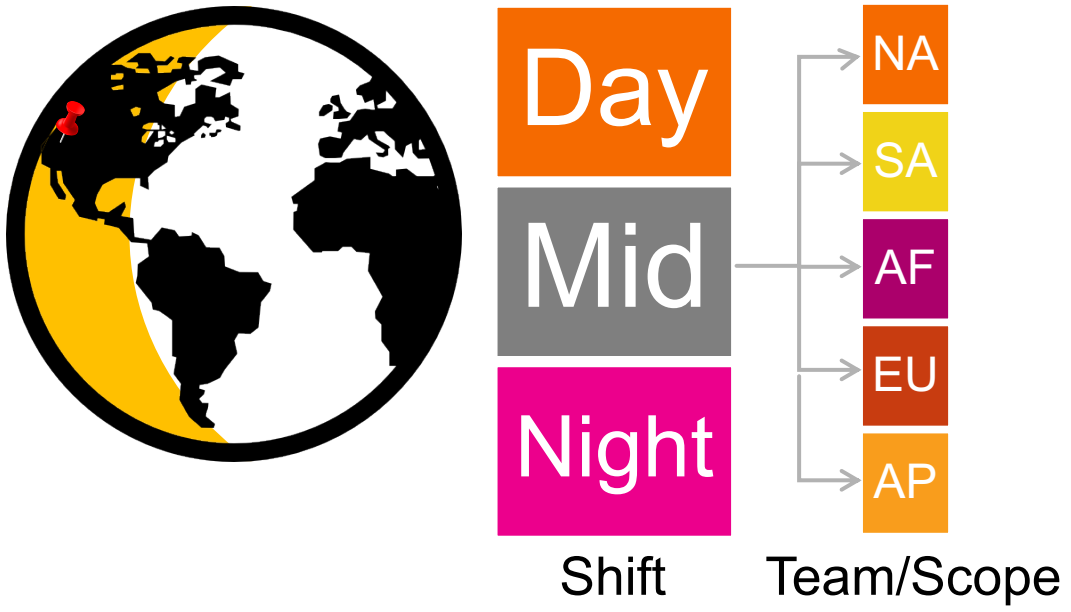
Introduction

Organizational Impact of Centralized Monitoring

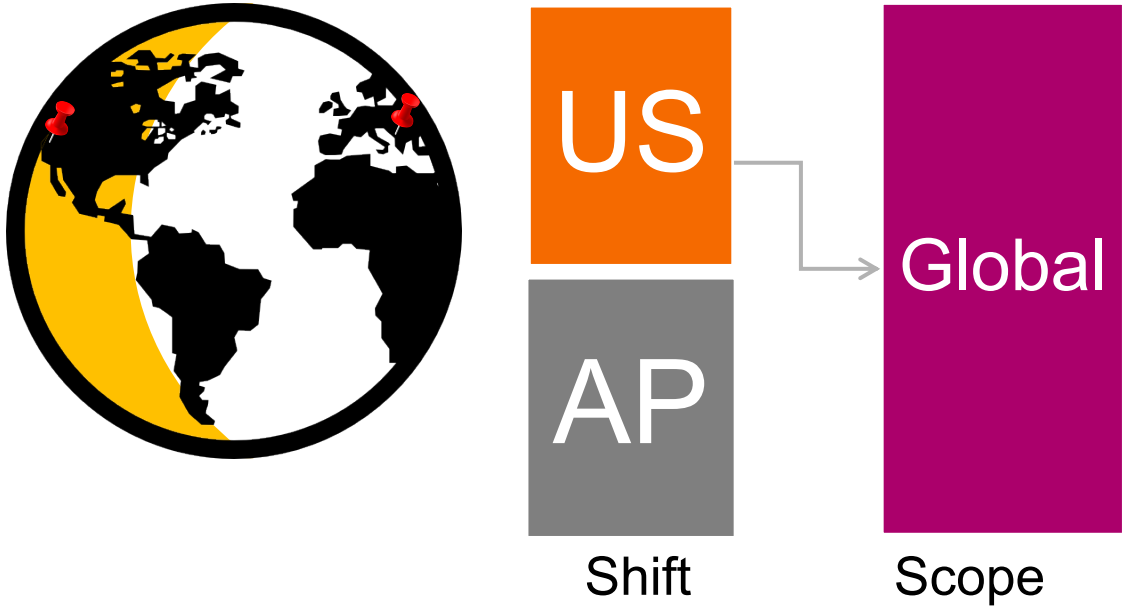
De-centralized Model

- Multiple teams
- Regional scope
- Shift-Work
- Vendor dependent



Centralized Model

- Fewer teams
- Global scope
- “Follow The Sun”
- Custom Detections



Overview

Lesson Learned #1: APT – Admin Persistent Threat

Lesson Learned #2: Scalable Maintenance & Macro Usage

Lesson Learned #3: Working With Timestamps

Lesson Learned #4: Standardizing Fields

Lesson Learned #5: Leveraging ES Frameworks

Lesson Learned #6: Data Hygiene

#1: Admin Persistent Threat

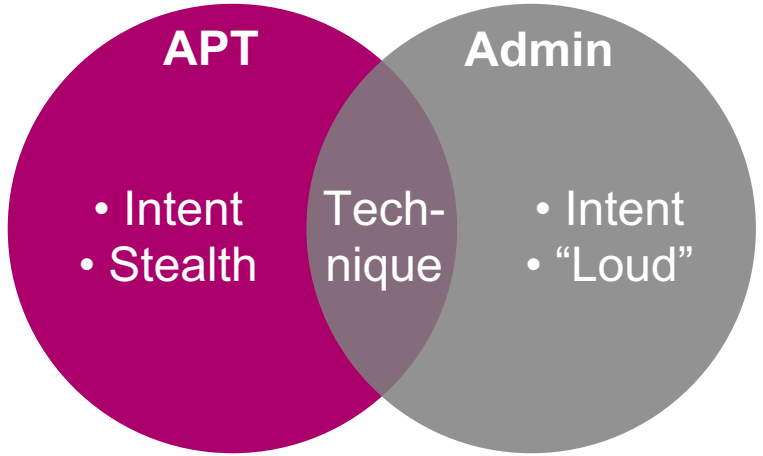
Distinguishing between admins & threat actors

Considerations for a successful Threat Detection Program

Environment Configuration

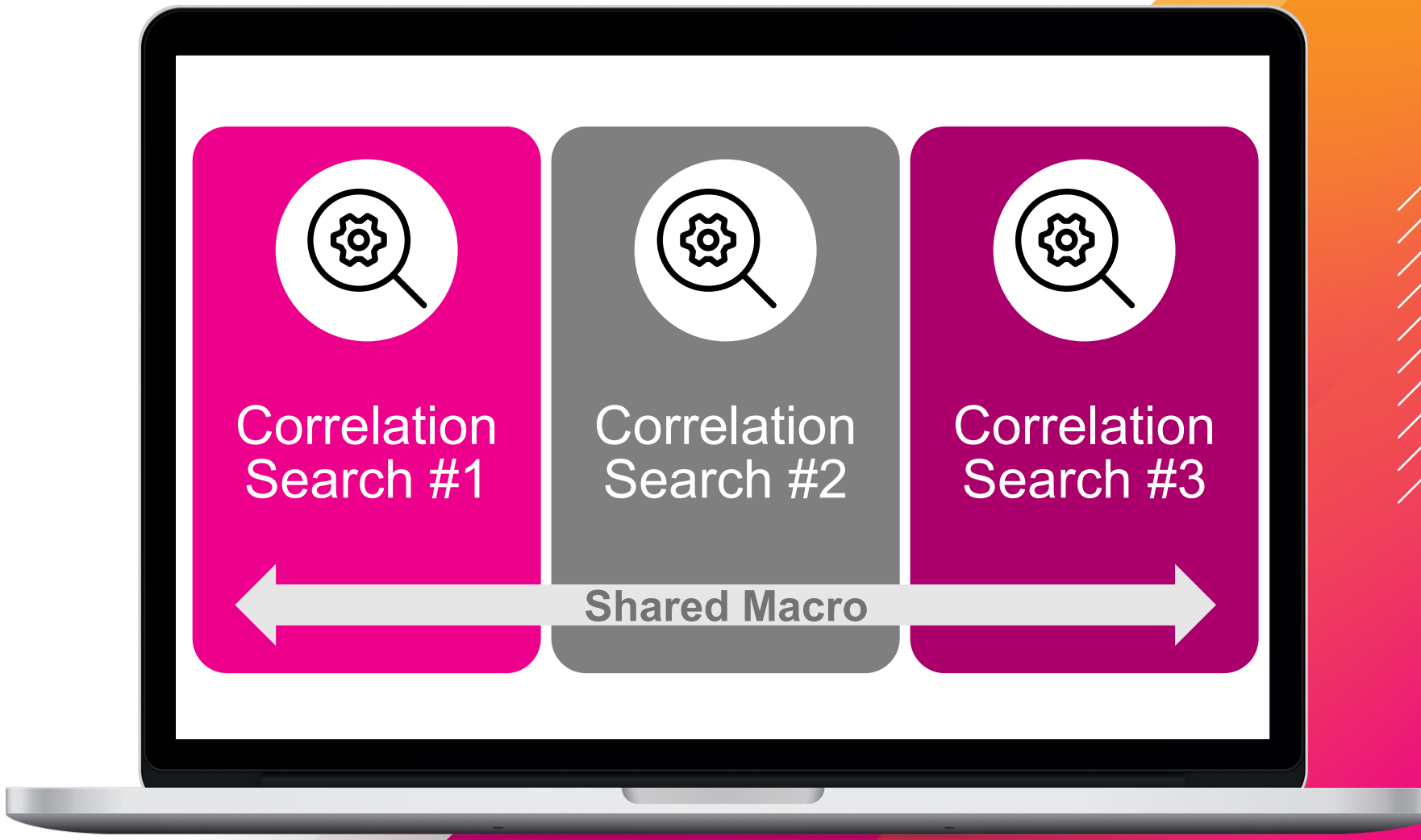
Noise Levels

User Base



#2: Scalable Maintenance & Macro Usage

Consistency, Scalability, User-Friendly



#2: Scalable Maintenance & Macro Usage

Consistency, Scalability, User-Friendly

All notables now have 3 new fields:

- action
- signature
- user

Advanced search » Search macros » add_aws_context

Definition * Enter the string the search macro expands to when it is referenced in another search. If arguments are included, enclose them in dollar signs. For example: $arg1$

```
| eval action = case(
    lower(blocked)="true","Blocked",
    lower(blocked)="false","Allowed",
    isnull(blocked),"Unknown"),

    signature = coalesce(signature,'detail.type',"N/A"),

    user = case(
    isnull(user) AND 'userIdentity.type'="IAMUser",'userIdentity.userName',
`comment("Normal user")`
    isnull(user) AND
'userIdentity.type'="AssumedRole",mvindex(split('userIdentity.arn',"/"),-1),
`comment("Temporary Credentials - User can be derived from arn")`
    isnull(user) AND 'userIdentity.type'="Root" AND NOT 'userIdentity.userName' = "Root"
AND NOT 'userIdentity.userName'="",'userIdentity.userName',    `comment("Root (Alias)
Credentials")`
isnull(user) AND 'userIdentity.type'="Root" AND
isnull('responseElements.accessKey.userName'),mvindex(split('userIdentity.arn',":"),-1),
`comment("This is usually 'root', even in the ARN like above. But I extract it, rather
than use a static string just in case it's ever somehow not.")`
    isnull(user) AND 'userIdentity.type'="Root" AND
isnotnull('responseElements.accessKey.userName'),'responseElements.accessKey.userName',
`comment("There is an obscure exception to the rule above.")`
    isnotnull(user) AND NOT user="", user, `comment("This field has been populated
elsewhere already.")`
    1=1,"N/A"
    ),
```

#2: Scalable Maintenance & Macro Usage

Consistency, Scalability, User-Friendly

Fieldnames (Before Macro)

Field
detail.resource.instanceDetails.networkInterfaces{}.networkInterfaceId
detail.resource.instanceDetails.networkInterfaces{}.privateDnsName
detail.resource.instanceDetails.networkInterfaces{}.privateIpAddress
detail.resource.instanceDetails.networkInterfaces{}.privateIpAddresses{}.privateDnsName
detail.resource.instanceDetails.networkInterfaces{}.privateIpAddresses{}.privateIpAddress
detail.resource.instanceDetails.networkInterfaces{}.publicDnsName
detail.resource.instanceDetails.networkInterfaces{}.publicIp
detail.resource.instanceDetails.networkInterfaces{}.securityGroups{}.groupId
detail.resource.instanceDetails.networkInterfaces{}.securityGroups{}.groupName
detail.resource.instanceDetails.networkInterfaces{}.subnetId
detail.resource.instanceDetails.networkInterfaces{}.vpcId
detail.resource.instanceDetails.platform
detail.resource.instanceDetails.productCodes{}.productCodeId
detail.resource.instanceDetails.productCodes{}.productCodeType
detail.resource.instanceDetails.tags{}.key
detail.resource.instanceDetails.tags{}.value
detail.resource.resourceType

Fieldnames (After Macro)

Field
host
source
sourcetype
account
action
app
blocked
category
cidrIp
dest
dest_port
detail.description
detail.title
detail.type
index
instanceId
src
src_port
user
vpcId

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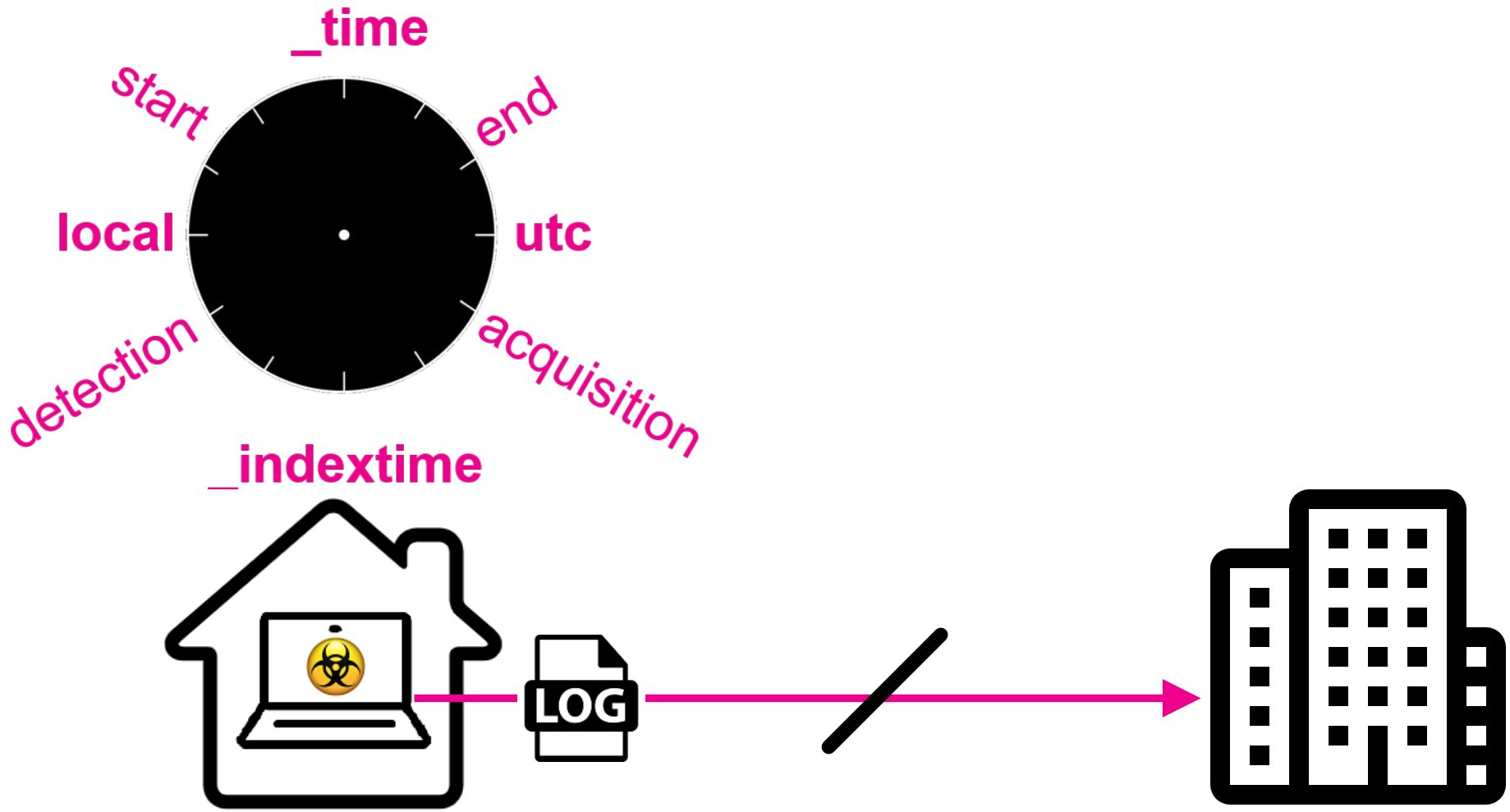
#3: Working with Timestamps

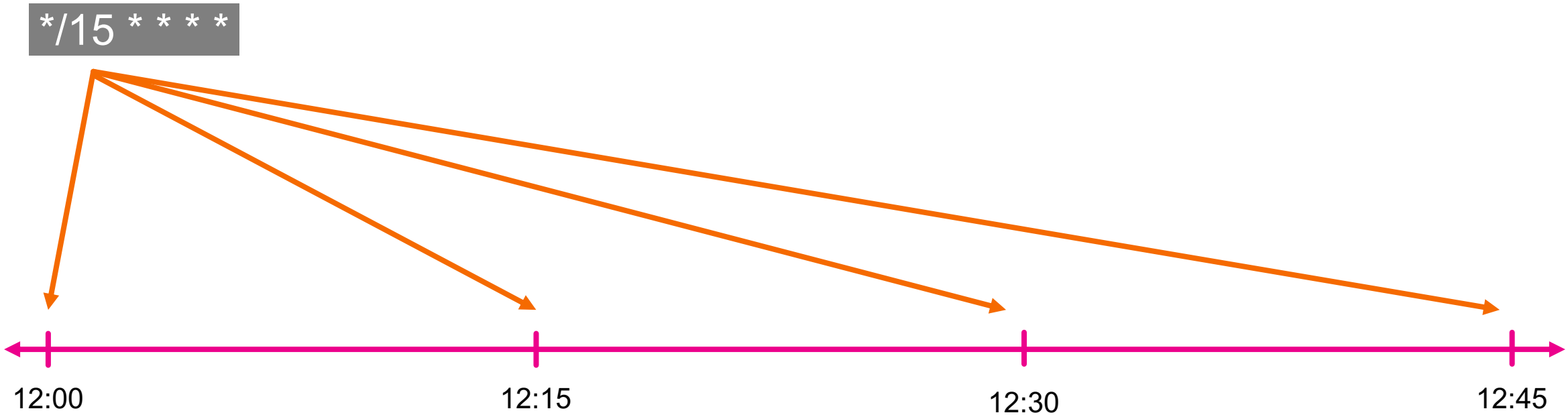
Trust but verify. Beware of delayed events



#3: Working with Timestamps

Gotchas when using _time

index=AV category=malware action=allow



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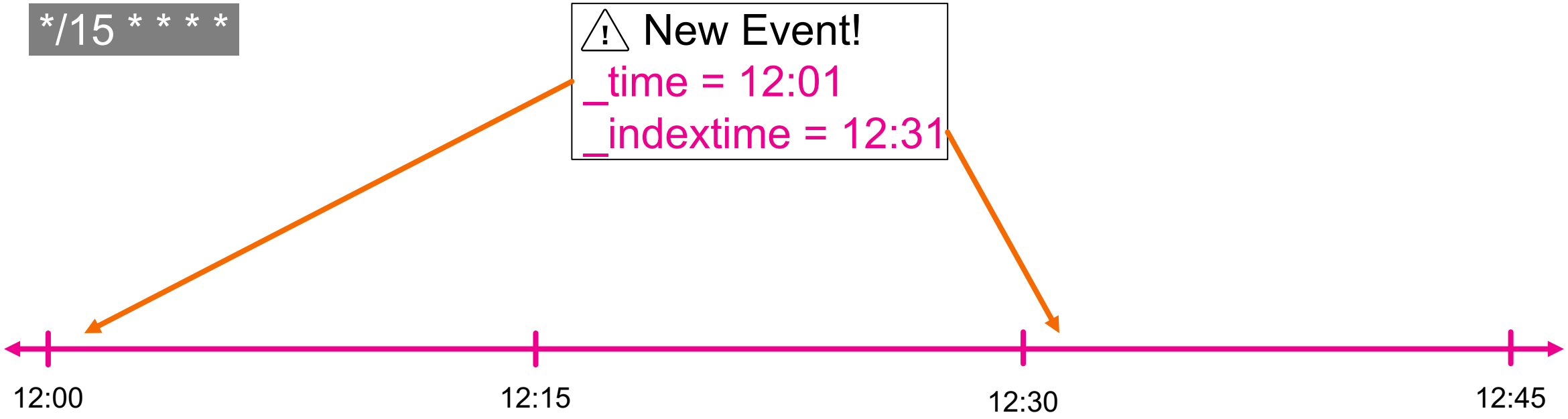
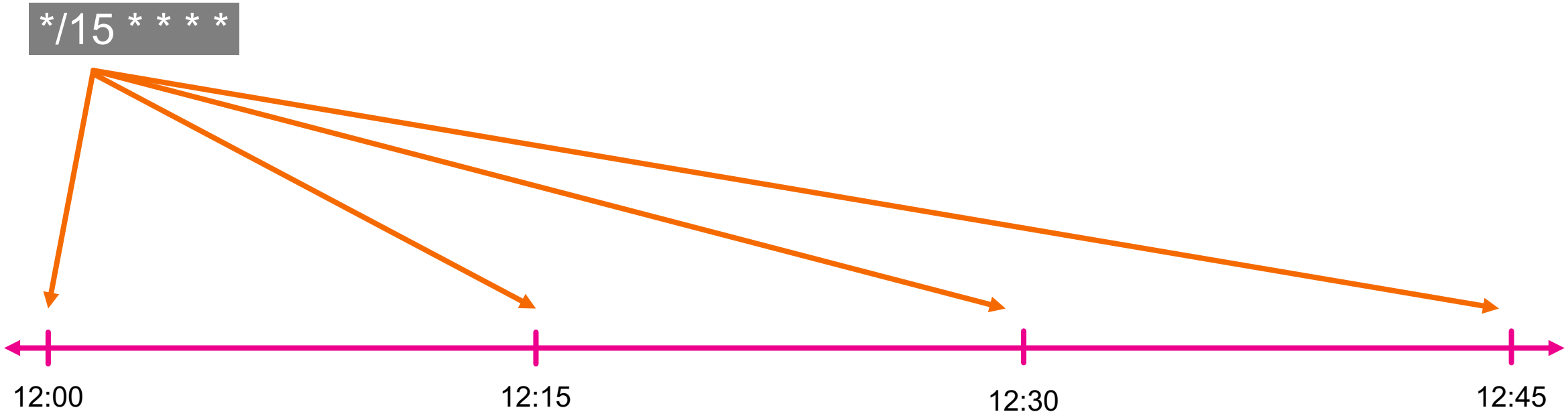


#3: Working with Timestamps

Gotchas when using _time

_index_earliest=-15m@m index=AV category=malware action=allow



#3: Working with Timestamps

Gotchas when using _indextime

_index_earliest=-15m@m ... <your search>

```
*/15 * * * *
```

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_index_earliest=-15m@m ... <your search>

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*/15 * * * *
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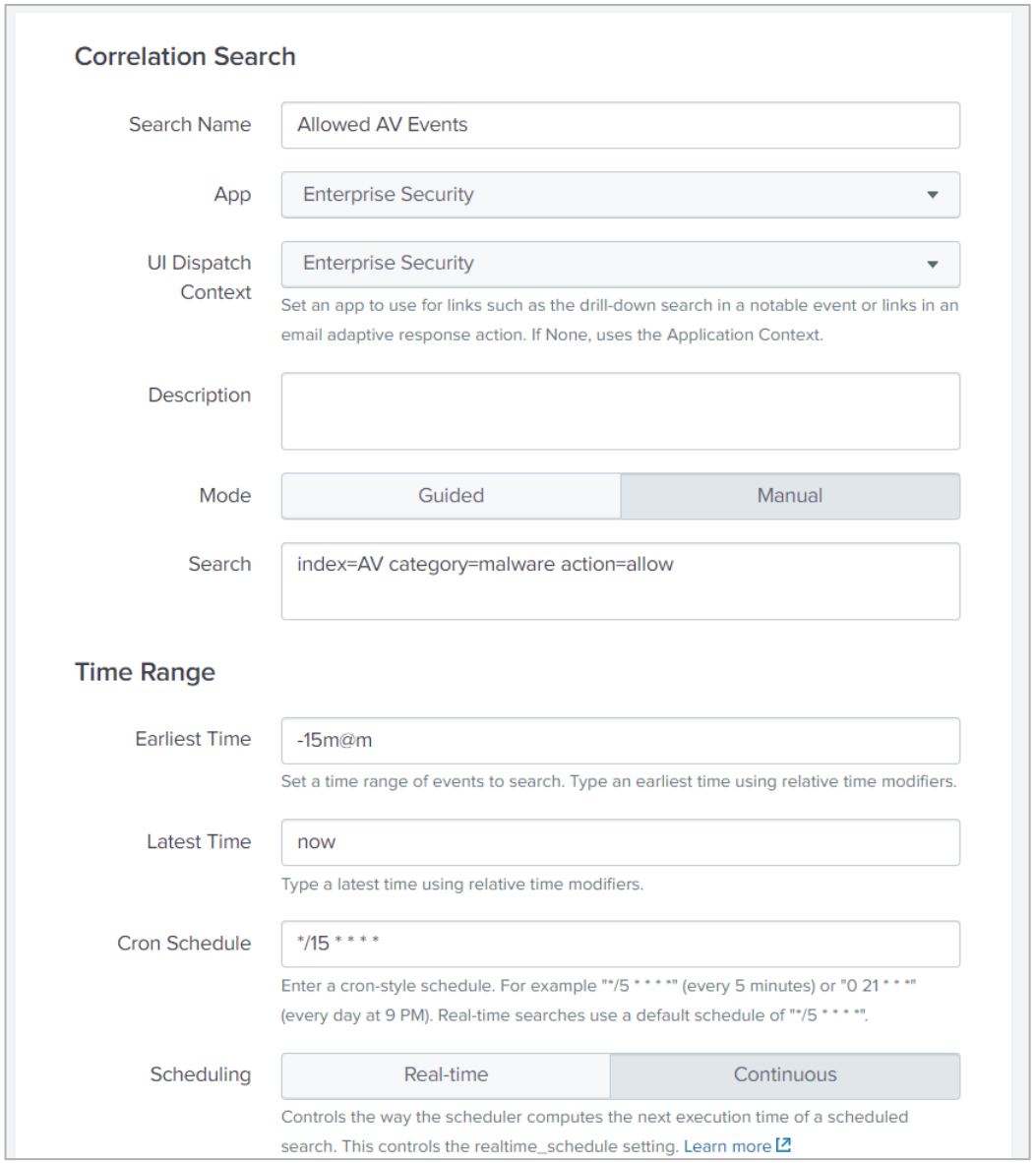
#3: Working with Timestamps

Gotchas when using _time



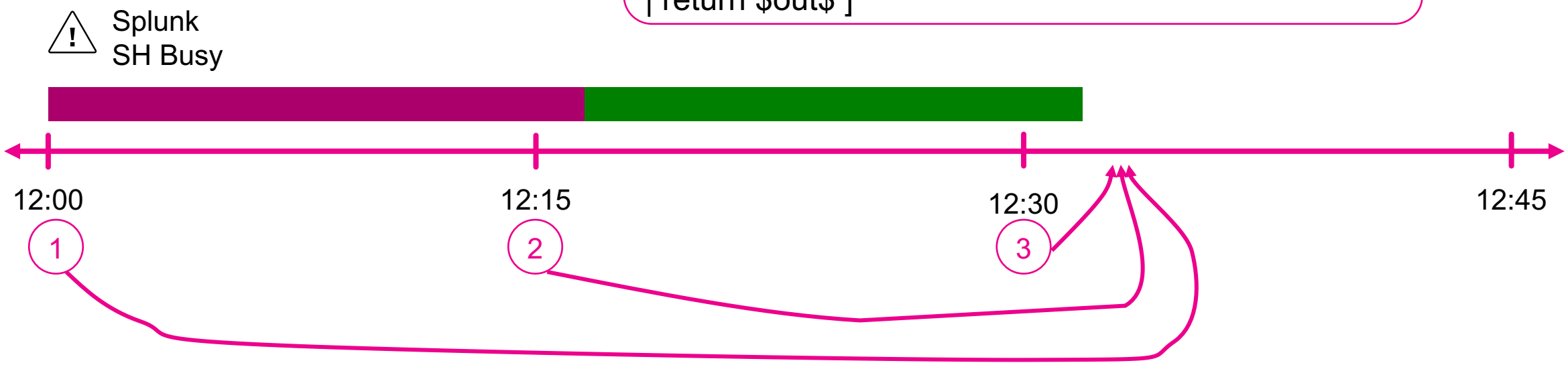
#3: Working with Timestamps

Gotchas when using _indextime

_index_earliest=`set_earliest(-15m@m)` ... <your search>

```
*/15 * * * *
```

```
[ | makeresults
| addinfo
| eval out=relative_time(info_max_time, "$time$")
| return $out$ ]
```



#4: Standardizing Fields

Setting Up Your Detection Program For Success

Why?

- Find what you are looking for in index=notable
- Integrate your alerts with ES frameworks
- Writing macros is easier
- Generate metrics
- All the same reasons you would use CIM (Common Information Model)

#4: Standardizing Fields

Setting Up Your Detection Program For Success

Decide on a naming strategy

Identify key pieces of information you always want to have

- Split it up by broad categories - users, computers, files, emails, cloud objects, etc.

Document it

Adhere to it

#4: Standardizing Fields

Setting Up Your Detection Program For Success

Object Type	Field	Required?	Note
All	signature	Yes, if applicable	Only required if it is a pass-thru alert
All	bunit	No	Business unit name
All	index	Yes	
All	sourcetype	Yes	
All	dvc	Yes	Created by `add_reqd_fields()` macro. Generic product name that is the source of the data (e.g. "Windows Event Logs").
All	special_time	Yes	Created by `add_reqd_fields()` macro
All	orig_raw	Yes	Created by `add_reqd_fields()` macro
System	src / dest	Yes	There should always be a src and/or dest field, it will be a copy of one of the other fields for devices (e.g. src_ip or src_host)
System	src_ip / dest_ip	Yes, if applicable	IPv4 and IPv6 are both acceptable
System	src_host / dest_host	Yes, if applicable	Host name or FQDN acceptable
System	src_mac / dest_mac	Yes, if applicable	If you have a MAC address, please call the `format_mac` macro to ensure formatting is consistent
System	md5 / sha1 / sha256	Yes, if applicable	
User	user	Yes	AD username such as "smithj" or "DOMAIN\smithj". If there is only a src OR dest user available, then use this field for either. If there is **both** a source and target/destination user available, then this should represent the **destination** user.
User	src_user	Yes, if applicable	AD username such as "smithj" or "DOMAIN\smithj". If there is both a source and target/destination user available, then this field should represent the source user.
User	email	Yes, if applicable	If you have an email address, please call the `format_email()` macro to ensure formatting is consistent

#5: Leveraging ES Frameworks

Build out frameworks **early**!

Assets & Identities

- Make ES your single pane of glass

Type	✓	Field	Value
Event	☐	user ▾	JSmith
	☐	user_buint ▾	CISO
	☐	user_category ▾	Security Analyst
	☐	user_email ▾	john.smith@example.com
	☐	user_identity ▾	jsmith
			john.smith@example.com

#5: Leveraging ES Frameworks

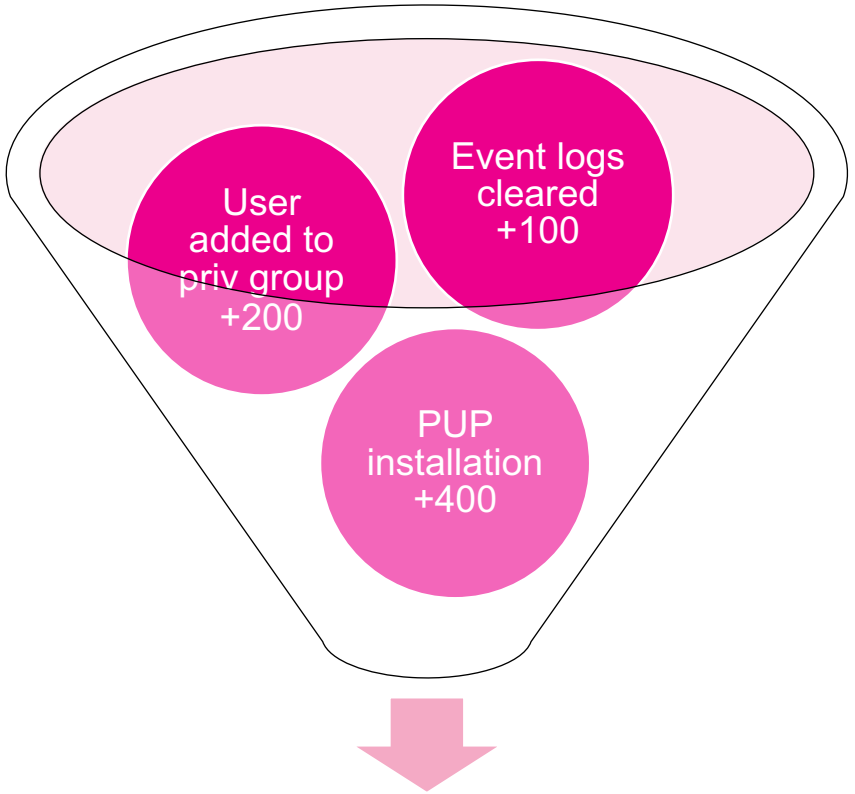
Build out frameworks **early**!

Assets & Identities

- Make ES your single pane of glass

Risk

- Get more value out of your detection content



Risk Score for Object = 700

#5: Leveraging ES Frameworks

Build out frameworks **early**!

Assets & Identities

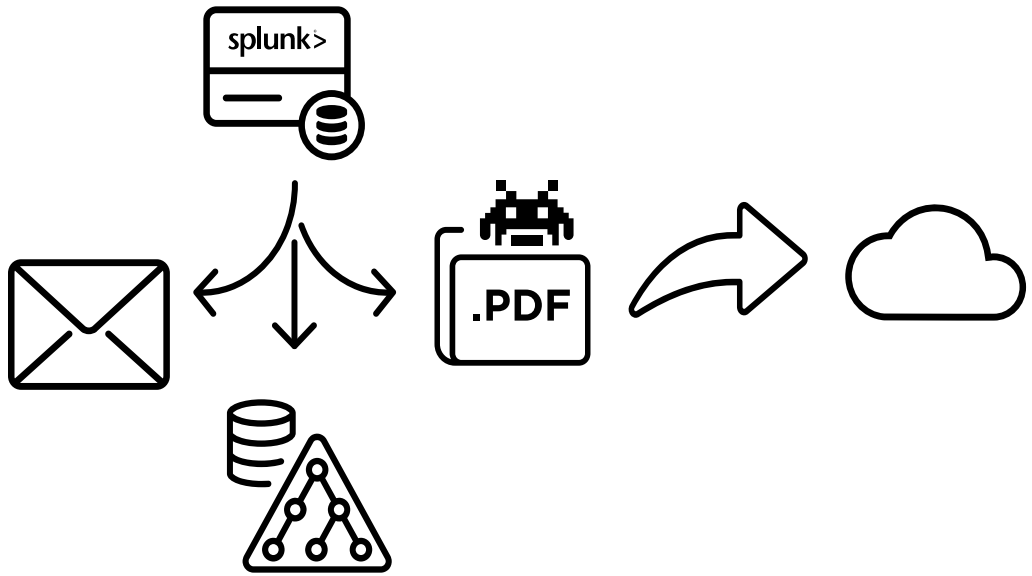
- Make ES your single pane of glass

Risk

- Get more value out of your detection content

Adaptive Response

- Creating / updating tickets
- Pulling in extra data
- External API actions



#6: Data Hygiene

Catching Things That Get Missed

I onboarded all my data into Splunk, now what?

Data model acceleration failing

- Search heads overtaxed

Data feeds stopping

- Network firewall changes

Field extractions or values changing

- Product version upgrade leads to change in log format

#6: Data Hygiene

Catching Things That Get Missed

At small scale you can make an alert for each sourcetype

- Use fieldsummary command to look for fields not being extracted
- Write a regex to match expected values of critical fields

Large scale environments require automated auditing of correlation searches

- Manual or automated Red Team testing
  - Free tools: Atomic Red Team, Endgame Red Team Automation, etc.
- Automate the whole process with tools such as: Verodin, SafeBreach, AttackIQ

Key Takeaways

1. Dedicate adequate attention towards maintenance cycles
2. Leverage macros & frameworks
3. Verify your timestamps & data feeds are working as expected

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Thank You!

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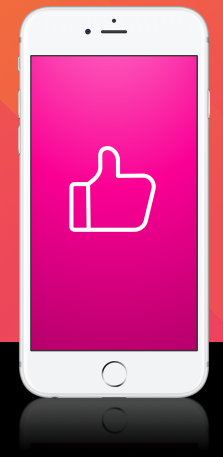
RATE THIS SESSION



Q&A

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