



THREAT TIMELINES FACILITATOR GUIDE

Secure Tomorrow Series

Non-federal facilitators: *The Cybersecurity and Infrastructure Security Agency (CISA) has provided this toolkit as a starting point for your organization to address these critical issues. Please feel free to expand upon or adapt these exercises and tools to your needs. In several places throughout the document, we have provided guidance for federal facilitators regarding participants, process, and information protections. This guidance is based upon federal requirements, which may differ from state and local considerations. Please consult with your organization to consider what language or actions you will need to take in hosting a session.*

GOAL

In *Threat Timelines*,¹ players generate fictional news headlines that describe future security threats to a particular technology or system and pertain to the topics of anonymity and privacy, data storage and transmission, and trust and social cohesion. Through these headlines, players build timelines of events (on a time horizon of five to twenty years) to help them: (1) think about plausible futures and reflect on emerging and evolving threats to critical infrastructure security and resilience, and (2) identify corresponding mitigating actions that can be put into motion today

KEY OUTPUTS

- A set of threat timelines that highlight various ways in which the three topics can intersect and influence each other, and how threats can emerge and evolve.
- A list of risk mitigation strategies that would increase the security and resilience of a particular technology or system.

DESIRED PARTICIPANTS

[Please note: *This activity requires between four and six participants. Invitations to participate should focus on individuals at the mid-to-senior career level who are interested in exploring longer-term threats to critical infrastructure to enable effective risk management. To provoke new lines of thinking, we recommend that you seek broad representation from regional Cybersecurity and Infrastructure Security Agency (CISA) personnel; state, local, tribal, and territorial planners; fusion center and intelligence community representatives; and other private sector, nonprofit, think tank, and academic stakeholders. In particular, individuals with expertise in the three topics (anonymity and privacy, data storage and transmission, and trust and social cohesion) and individuals who are already familiar with strategic foresight are encouraged to participate. If the activity sponsor is interested in exploring a specific technology or system, be sure to target experts in that domain.]*

¹ *Threat Timelines* is based on ideas presented in a paper by Wong and Nguyen. Ref: Richard Y. Wong and Tonya Nguyen, *Timelines: A World-Building Activity for Values Advocacy*, in CHI Conference on Human Factors in Computing Systems, May 8–13, 2021, Yokohama, Japan, <https://dl.acm.org/doi/fullHtml/10.1145/3411764.3445447>. Accessed on September 30, 2021.

[Once known, this section of the guide would list the participants, their titles, and the agencies/organizations they represent.]

FORMAT

Threat Timelines is designed to take place over one hour or one-and-a-half hours. The activity can be executed either virtually or in person.

SUPPORT STAFF

- Facilitator
- Scribe

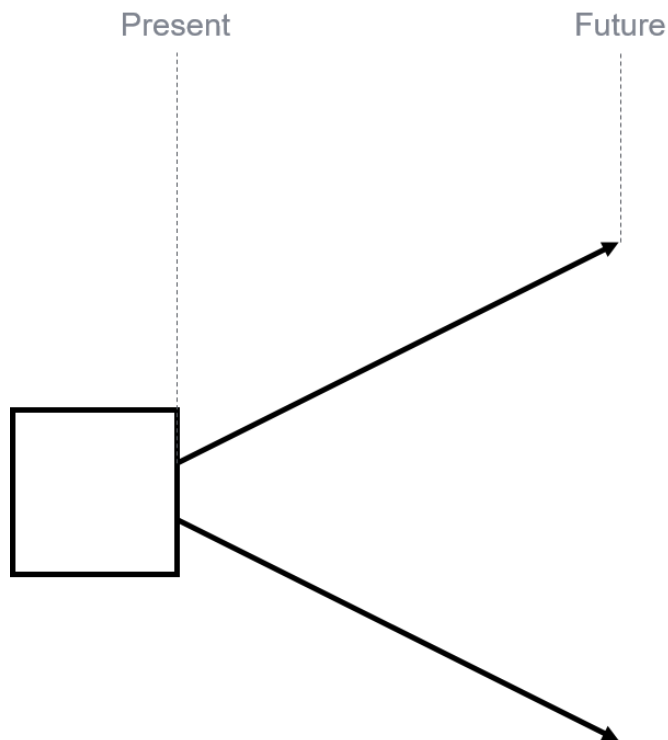
SUPPORT MATERIALS

Virtual and in-person games have different requirements:

- **Virtual:** A virtual whiteboard platform and a virtual deck of playing cards (that allows for randomly drawing and showing individual cards).
- **In person:** A large timeline triangle drawn on a large piece of paper or whiteboard (see Figure 1), sticky notes (two colors), markers, and a standard deck of playing cards.

Additionally, participants should receive the player read ahead for the game.

FIGURE 1. STARTING BOARD SETUP FOR IN-PERSON VERSION



PREPARATION

Facilitators should be comfortable leading a group activity and providing positive reinforcement to players. In addition to reviewing this guide, the facilitator should take the following actions in advance of the activity.

- Become familiar with the three topic areas.
- Send the [Threat Timelines Read Ahead](#) to players one week before the session.
- **Provide participants with the following disclaimer:** Participants are reminded that any information shared during this workshop is provided on a voluntary basis. Sensitive information, to include confidential or proprietary information, should not be shared. Information shared during this workshop may be recorded for the purposes of facilitating the program and discussions; however, discussion or disclosure of information in these sessions is not a substitute for submission under the Protected Critical Infrastructure Information (PCII) Program. Information may therefore be subject to Freedom of Information Act (FOIA) requests or other mechanisms that would publicize any information shared or recorded.
- Review the list of players and become familiar with their backgrounds and affiliations.
- Determine with the sponsor whether participants will receive a copy of the timeline and notes from the session.

For virtual executions, the facilitator should be comfortable using the virtual whiteboard platform selected. If the facilitator wants to allow all players to add headlines to the virtual gameboard simultaneously (see Step 2: Building Timelines), he or she may need to help players set up accounts. Additionally, the facilitator should consider creating a test gameboard, sharing its link to players to test access to the platform, and encouraging them to practice any relevant functionality ahead of the game. Finally, the facilitator should prepare a brief in-game tutorial on how to use the platforms.

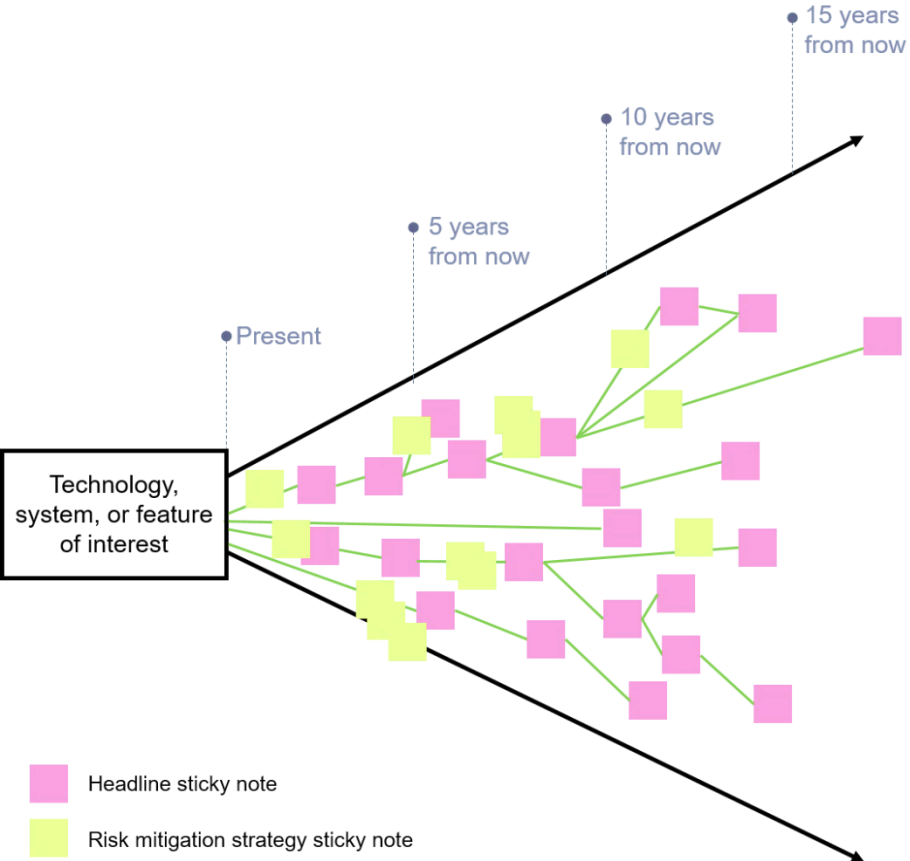
OVERVIEW OF GAMEPLAY

Threat Timelines consists of three steps:

- **Step 1:** As a group, players choose a particular technology or system to explore.
- **Step 2:** Using sticky notes, players individually brainstorm news headlines related to the selected technology or system, and place these headlines on the game board (and link them to previously added headlines, if relevant) to create timelines of events.
- **Step 3:** Players participate in a facilitated discussion to reflect on the timelines. Using sticky notes of a different color, they identify and place mitigating strategies that might help address the threats posed in a timeline.

At the end of the game, players will have developed a series of timelines describing chains of events (through news headlines) and associated risk mitigation strategies. Figure 2 shows a notional example of what the gameboard might look like at the end of play.

FIGURE 2. NOTIONAL EXAMPLE OF A GAMEBOARD POPULATED WITH MULTIPLE TIMELINES (IN GREEN), AS GENERATED FROM PLAYERS' SUBMITTED NEWS HEADLINES



SESSION BREAKDOWN

I. INTRODUCTORY (15 minutes)

After welcoming participants and facilitating player introductions, the facilitator will provide background on the objectives and outputs for the game, as well as outline the agenda. Facilitators will then note to participants that the intention of the session is not to bring the group to agreement, and that CISA (and, if applicable, the facilitating organization) is not seeking consensus input or recommendations.

Breakdown	<ol style="list-style-type: none"> 1. Welcome 2. Participant introductions 3. Review of objectives and desired outputs 4. Agenda
Script	<p>A sample script for item #3 (review of objectives and desired outputs) is as follows:</p> <p><i>This activity, Threat Timelines, uses fictional news headlines to help you imagine security threats to a particular technology or system on a time horizon of five to twenty years. It focuses on three topic areas: anonymity and privacy, data storage and transmission, and trust and social cohesion. The goal of this activity is to think about plausible futures—reflecting on emerging and evolving risks to cybersecurity and infrastructure security and resilience—and to help identify mitigating actions that can be put into motion today.</i></p> <ul style="list-style-type: none"> ▪ <i>Coming out of the activity, players will have developed a set of mitigating actions to forestall the identified threats, and will better understand the ways in which the three topics intersect and influence each other. This activity is not intended to bring your group to agreement, but rather to develop an understanding of potential changes in the topic areas. CISA [and, if applicable, the facilitating organization] is not seeking consensus input or recommendation.</i>

II. STEP I: DECIDE ON A TECHNOLOGY OR SYSTEM (5–10 minutes)

The facilitator assists players in identifying and selecting a single technology or system to explore during the game.

Breakdown	<ol style="list-style-type: none"> 1. Provide example ideas (e.g., a social media platform, a nuclear power plant, facial recognition technology, deepfake technology, ransomware, etc.). 2. Solicit ideas from the players. If you elected to have participants submit ideas ahead of time, list them out first (without attribution) before asking for additional ideas.
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	3. Choose a single technology or system to move forward with. Insert the name of the technology or system into the square on the left side of the gameboard (see Figure 1).
Script	Scripting is minimal since the facilitator will largely be asking for and reacting to player input. However, the facilitator might start off by stating: <ul style="list-style-type: none"> ▪ <i>To begin, let's decide on a technology, system, or feature that we would like to explore in today's game.</i>
Facilitator Guidance	<ul style="list-style-type: none"> ▪ Be prepared to help players agree on what technology or system to move forward with. Steer the group towards ones that will stimulate discussion. You should also have latitude to incorporate sponsor interests and to adapt or consolidate participant ideas, particularly if an idea is too narrow and would exclude meaningful participation from one or more players. ▪ In the interest of time, if a player comes up with multiple ideas, ask which one he or she would be the most interested in exploring. Make sure to record the remaining ideas for future games. ▪ The technology or system does not need to be “speculative” or “futuristic.” However, players should be able to envision future developments for it that would introduce new risks to or from its use. ▪ If a player begins to speculate about possible threats associated with a particular technology, gently suggest that the group move ahead with that technology and begin the exercise. ▪ Please note that some technologies (such as facial recognition) may lend themselves more readily to a time horizon of five to ten years, while others (such as artificial intelligence) may lend themselves more readily to a 20-year time horizon.

III. STEP 2: BUILDING TIMELINES (20–40 minutes)

After picking a technology or system, players work together to build timelines. Specifically, players add fictitious headlines to the gameboard via sticky notes, taking into consideration when (i.e., what year) the headline would occur and its connection to any previously added entries. Headlines taking place further into the future are placed farther to the right on the gameboard.

Initially, the facilitator will assist players in crafting their headlines and adding them to the gameboard. Depending on the comfort level of players and the selected technology or system, the facilitator should decide whether the process of adding headlines should remain turn based or transition into simultaneous play:

- **Turn-based play:** This approach gives the facilitator more control in assisting players with crafting headlines and gives the facilitator control over the gameboard. However, this style of play is slower, meaning that producing timelines on a time horizon of five to twenty years may take longer.

- **Simultaneous play:** This approach is faster than turn-based play, and may result in timelines with longer time horizons. However, simultaneous play gives the facilitator less control and makes it more challenging for the facilitator to develop narratives for the facilitated discussion that follows in Step 3. In a virtual environment, simultaneous play also requires participants to familiarize themselves with how to operate the virtual whiteboard and virtual deck of cards.

<p>Breakdown</p>	<ol style="list-style-type: none"> 1. Explain what the various card suits mean and demonstrate the creation and placement of the first headline. Afterwards, relay tips for generating and placing headlines to players. 2. Select a player to provide the next headline. Assist the player in crafting a headline and adding it to the gameboard. Rotate to the next player. 3. After the first few turns, determine whether to continue with turn-based play or ask players to switch to simultaneous play. If switching to simultaneous play, you may need to provide a brief tutorial on how to use the virtual card deck and the necessary virtual whiteboard functions. 4. Continue adding headlines until time elapses.
<p>Script</p>	<p><i>Now we will begin building timelines. We build timelines by coming up with fictional headlines from the future.</i></p> <p><i>To come up with these headlines, we will first pull a card from the deck. The suit of the card dictates the theme of the headline.</i></p> <ul style="list-style-type: none"> ▪ <i>SPADES: Anonymity and privacy.</i> ▪ <i>HEARTS: Data storage and transmission.</i> ▪ <i>DIAMONDS: Trust and social cohesion.</i> ▪ <i>CLUBS: Name a new stakeholder.</i> <p><i>If you draw a club, look at the gameboard and see what stakeholders are listed. Come up with a stakeholder who has not yet been mentioned and name them. You can either use this stakeholder to come up with a headline yourself or pass the stakeholder on, challenging [the next player (in turn-based play)/another player in the room (in simultaneous play)] to come up with a headline involving that stakeholder.</i></p> <p><i>Let me demonstrate. [Pick a card from the deck and come up with a headline. Think aloud as you come up with your headline, explaining each step of the process (For example, “I picked a spade, so I’ll have to come up with a headline around anonymity and privacy.”). Write your headline out, say it out loud, and place it on the gameboard, taking into consideration when you think it will occur.]</i></p> <p><i>[After demonstrating, give players a few tips for placing headlines.] Here are a few tips for coming up with headlines:</i></p>

	<ul style="list-style-type: none"> ▪ <i>First, try your best to place headlines in chronological order. Verbalize whether it comes "after," "before," "at the same time," or "separate from" other headlines on the board.</i> ▪ <i>Second, use headlines as jumping off points whenever you can. That helps us build into the future.</i> ▪ <i>Third, conflicting timelines are okay! That's why our timelines are separate.</i> <p>[Next, have each participant come up with a headline in order, rotating around the group until everyone has had a chance.]</p> <p>[If switching to simultaneous play, provide instructions for accessing the platform and a brief tutorial on how to use the key functions before giving all players the freedom to create and place as many notes as they would like (while still abiding by the game rules).]</p> <p>[Continue adding headlines until time elapses.]</p>
<p>Facilitator Guidance</p>	<ul style="list-style-type: none"> ▪ Keep the discussion as free flowing as possible while identifying a variety of threats, assisting players in defining a plausible time horizon for the events taking place, and constructing plausible chains of events that help tell the story of how the threat might emerge or evolve over time. <ul style="list-style-type: none"> ○ It is okay for participants to disagree. ○ Generating new and different ideas is more important than building consensus. ▪ Players should attempt to create specific, memorable headlines to help drive the narrative. Examples include the following: <ul style="list-style-type: none"> ○ Employee camera went off during intimate moment at work: Employee fired. ○ This guy hacked his posture sensor to lower his health insurance premium. Doctors hate him! ○ For efficiency, Tezlar batteries store data about usage. Then they got "extortionward." ▪ When players are imagining headlines: <ul style="list-style-type: none"> ○ Encourage them to have fun. Clickbait headlines and social media posts are also fine. ○ Always be affirmative of headlines that players generate. Give positive reinforcement to the aspects of the headline that are good. ○ If a headline is too vague or off topic, help smooth it out or even refine it iteratively with the player. If in simultaneous play, ask who came up with the headline and then work with that player directly to refine the headline. ○ Encourage players to come up with at least one positive and one negative headline.

	<ul style="list-style-type: none">○ Avoid creating hyperbolic dystopian or utopian visions of the future. Toward this end, remind participants to create both positive or negative headlines (if necessary).▪ When players are placing headlines, please take into consideration the following:<ul style="list-style-type: none">○ Although headlines do not need to be placed in a strict (i.e., precise) chronology, placing them roughly in a logical order provides a useful, but flexible, set of constraints and helps elicit discussion on secondary and tertiary effects, as well as potentially unanticipated outcomes.○ When players place a new headline on the timeline, have them verbalize whether it comes “after,” “before,” “simultaneously with,” or “separate from” another headline already on the gameboard.○ Encourage players to continue writing and sharing new headlines as new ideas come up.▪ Some players may dispute the congruence of some headlines. Remind them that conflicting headlines are fine. Real technologies get adopted and used in varying (sometimes conflicting) ways.
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IV. **STEP 3: REVIEW THE TIMELINES AND IDENTIFY MITIGATION STRATEGIES** (20-25 minutes)

Players shift into a facilitated discussion about the timelines. The facilitator asks players what can be done today to make the identified threats less harmful in the future.

Breakdown	<ol style="list-style-type: none"> 1. Facilitate discussion around the three lines of inquiry (see the “Script” box below). Solicit risk mitigation ideas from players and add them as sticky notes (using a different color) to the gameboard. 2. Thank the players for their participation.
Script	<p>This step is unscripted because the facilitator is reacting to and building on player responses to the following three lines of inquiry:</p> <ul style="list-style-type: none"> ▪ Which of these timelines is the most concerning? Why? ▪ Are there common themes among the timelines? If so, what are they? ▪ What can we do in the present to make harmful or undesirable timelines less likely?
Facilitator Guidance	<ul style="list-style-type: none"> ▪ For the first line of inquiry, allow sufficient time for debates to settle. Players will likely focus on a few items of concern that you should keep track of. If a prolonged debate ensues, try to encapsulate both sides of the debate, remind players that consensus is not necessary, and move the discussion forward in the interest of time. ▪ For each mitigation strategy identified, ask players where it should go on the gameboard. Encourage players to place these mitigations just prior to the headlines they would address. ▪ Before concluding the session, either take a picture or export an image of the final gameboard.